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COLLEGE OF AGRICULTURE  
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# ECONOMIC ASPECTS OF THE PEAR INDUSTRY

S. W. SHEAR

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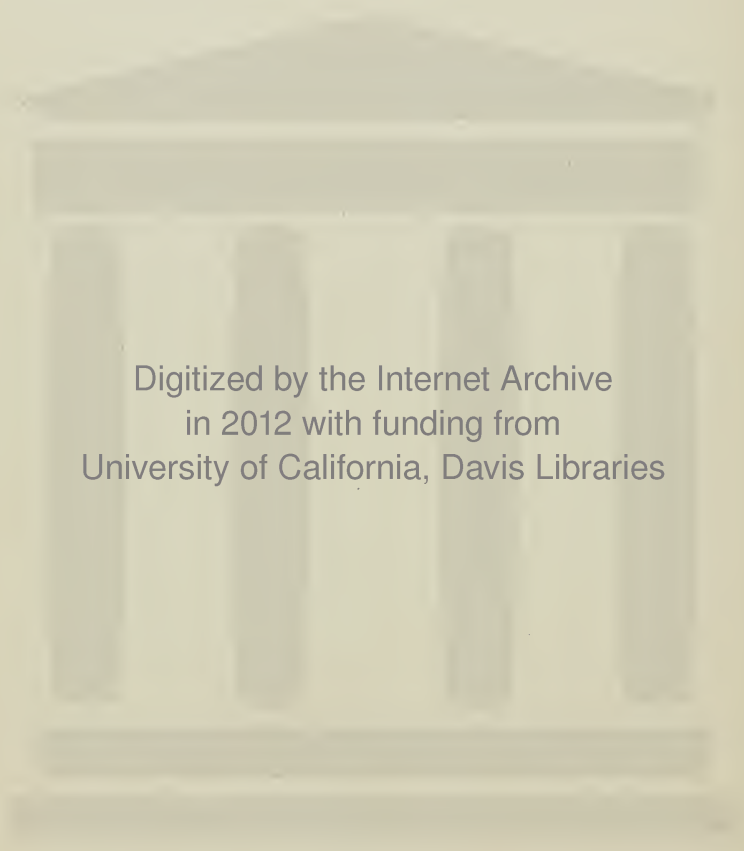
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# ECONOMIC ASPECTS OF THE PEAR INDUSTRY<sup>1</sup>

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## SUMMARY AND CONCLUSIONS

During the last two decades the pear industry of the United States has been characterized by the rapid extension of acreage, production, shipments, and canned output of pears on the Pacific Coast, compared with the relatively slow growth of the industry east of the Rocky Mountains. The ravages of pear blight have been the chief obstacle to the extensive development of the pear industry in the east. In many sections of the Pacific coast, however, the blight is naturally much less serious and, in addition, improved methods of prevention and control have been so diligently used that the disease, particularly in California, has destroyed relatively few trees during the last decade.

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<sup>1</sup> *Acknowledgments.*—Preparation of this bulletin has been greatly facilitated by the generous assistance of many individuals and organizations, to whom the author wishes to express his thanks. Among the agencies that have given liberally of their time and data are the Divisions of Crop Estimates, Fruits and Vegetables, and Statistical and Historical Research, of the Bureau of Agricultural Economics of the United States Department of Agriculture; the Bureau of the Census and the Bureau of Foreign and Domestic Commerce, of the United States Department of Commerce; the California Cooperative Crop Reporting Service; the Southern Pacific, and the Atchison, Topeka and Santa Fe railroads; the Pacific Fruit Express, the Santa Fe Refrigerator Dispatch, and the American Railway Express companies; the California Fruit Exchange, the California Fruit Distributors, the Stewart Fruit Company, the California Growers' and Shippers' Protective League, the Cannerymen's League of California, the Pacific Northwest Cannerymen's Association, the Association of New York State Cannerymen, the Dried Fruit Association of California, the Pacific Coast Association of Nurserymen, Libby, McNeil and Libby, the California Packing Corporation, and the Agricultural Department of the Los Angeles Chamber of Commerce; Professors W. S. Brown and F. C. Reimer and Mr. R. S. Besse of the Oregon Agricultural College; Mr. M. D. Armstrong of the State College of Washington; Mr. Howard C. Rowley, editor of the California Fruit News; and Mr. A. B. Humphrey, Mrs. H. W. Bartell, Mr. Eugene G. Cutter, Mr. O. K. Conant, President of Yakima Horticultural Union, Mr. Wendell P. Brown, District Horticultural Inspector at Yakima, Washington, Mr. Robert E. Shinn of the Growers Exchange, Medford, Oregon, and Mr. Frank T. Swett, President and Manager of the California Pear Growers' Association.

From among the members of the University staff, valuable suggestions have been received from Dr. W. P. Tufts, Professor C. M. Titus, Dr. H. R. Wellman, Mr. L. W. Fluharty, Mr. L. C. Barnard, and Mr. C. S. Myszkowski. Within the Division of Agricultural Economics valuable assistance was received from Dr. H. E. Erdman and Dr. Emil Rauchenstein. The statistical computations were mostly made by Miss Gladys E. Platts.

<sup>2</sup> Junior Agricultural Economist in the Experiment Station.

Favored by nature and encouraged by high prices during and right after the war, average production and shipments of Pacific Coast pears increased over 60 per cent from 1920 to 1925. If the average rate of increase in production in this section of about 10 per cent a year, which has taken place since 1920, is maintained until 1930, as seems probable, the average crop for the three years 1924-1926 of 11 million bushels (about 275,000 tons), will have expanded to an annual average of perhaps 18 million bushels (about 450,000 tons). If nothing unexpected happens to the pear industry, average national production may be in the neighborhood of 28 million bushels (about 700,000 tons) by 1930, or about one-third greater than the average crop of about 21 million bushels (approximately 500,000 tons) for 1924-1926.

The seriousness of the continued increase in far-western production lies in the probability that the prices which the pear growers of this section receive in the near future will average appreciably lower than in recent years, unless costs of marketing are noticeably cut and foreign and domestic demand greatly stimulated by advertising and extended through improved distribution. Furthermore, the possibility that pear prices in the future may remain at a lower level than in recent years, is suggested by the fact that there is a large and increasing acreage of California pear orchards in sections in which the majority of growers can produce pears profitably at a price considerably below the average they have received in the last few years. It should also be remembered that national production of many fruits, several of which compete with pears, has increased rapidly in the last decade, making it more difficult to market most fruits at satisfactory prices in years when weather conditions have been favorable for good yields.

California Bartlett pear shipments to eastern markets meet little competition from pears from other sections of the country until the last of July, when shipments of pears from this state have normally reached a peak or have started to decline slightly. The dominant influence of California supplies upon Bartlett prices is shown by the fact that over 92 per cent of the changes in the weekly delivered-auction prices of California Bartletts in New York City in 1925 and 1926 are accounted for by changes in the weekly volume of auction sales. About 90 per cent of the changes in price are accounted for by variations in shipments of pears from California two weeks previously.

During August and the first part of September, California Bartlett pear shipments usually decline until they become unimportant, while

pear shipments from the Pacific Northwest, normally California's only important competitor in eastern markets, increase steadily in volume. Late varieties of California pears, which seldom begin to move to eastern markets in large quantities until after the middle of September, compete much more keenly with Oregon and Washington pears than do Bartletts, since practically all the fall and winter varieties, none of which are canning pears, are sold for consumption as fresh fruit. What competition California may experience from eastern pears affects the price of late varieties rather than of Bartletts, except, perhaps, in seasons when pears from this state are unusually late or when eastern pears ripen unusually early.

The decisive tendency for the price of California fresh pears to rise in eastern markets as current market supplies decrease, or to fall as supplies increase, suggests the desirability of supplying consumers with more fresh pears in periods of the year now apparently under-supplied. It also emphasizes the need of more equitable distribution between markets at all times. During the peak weeks of the shipping season careful study of available facts is necessary to enable growers to decide whether to sell to the canneries or to other local buyers, or to ship on their own account and either sell immediately upon arrival in eastern markets or to hold in storage temporarily until prices are more favorable.

The increasing proportion of fall and winter varieties of pears which has been planted on the Pacific Coast in recent years, because of their high price, indicates one important way in which the marketing season for fresh pears has been extended and probably can be further extended, to a limited degree, in the future. Any expansion in plantings of late varieties of pears should, however, not be large. Those making such plantings should remember that some of the best of these varieties are slow in coming into bearing, and produce rather low and variable yields. Moreover, the taste of many consumers for any pear other than the Bartlett must be cultivated. Although the better late varieties, such as Bose and Anjou, have commanded a high premium over Bartlett prices in Eastern markets during the last ten years, a considerable part of it is absorbed by cold-storage charges. Furthermore, the premium has already begun to decrease and will probably continue to do so for some time, because of increasing production.

The canned-pear industry of the country centers on the Pacific Coast, which section contributed about 90 per cent of the 3.8 million cases of pears canned in the United States in 1925, utilizing nearly one-fourth of its total pear crop in this manner. The canned-pear

output of Oregon and Washington has increased with amazing rapidity in the last two decades, the pack of the last two years being about thirty-five times the pre-war canned output. Less than 5 per cent of the national output of canned pears was packed in the Pacific Northwest before the war and about 30 per cent in the last few years. The average California pack of over 2 million cases in recent years, which has constituted almost 60 per cent of the national output, has been almost three times the pre-war pack and has utilized about one-fourth of the total production of pears in the state. The quantity of pears canned in the United States as a whole has practically trebled in the last 15 years, while the population of the country has increased only about 23 per cent, and exports have little more than kept pace with the increasing pack.

With the outlook for a considerable increase in Bartlett pear production in both California and the Pacific Northwest in the next few years, it seems that the canned-pear output of the Pacific Coast will probably expand appreciably within a few years. Any considerable expansion, however, will probably cause a noticeable decline in canning-pear prices unless the demand for canned pears is substantially increased. Whether any considerable increase in the demand for canned pears can be profitably brought about is open to serious question, however, because of the continually expanding world output of other canned fruits and also of dried and of fresh fruits which compete with pears in both our foreign and our domestic markets. Our output of canned peaches, apricots, and Hawaiian pineapples is now about three and a half times its pre-war volume. Likewise the national output of dried fruits, which probably compete with canned pears, to a limited extent at least, has doubled within fifteen years.

The vital dependence of our canned-pear industry upon foreign markets is shown by the fact that nearly one-half of the United States pack has been exported in recent years. The import statistics of the United Kingdom, which country has taken about 90 per cent of our canned-pear exports (equivalent to over 40 per cent of our national pack) in recent years, indicate that our exports, not only of canned pears, but also of canned peaches and apricots, have, in the last twenty years, probably increased at about the same rate as our canned output. Recently our exports of canned pears to the United Kingdom have been practically as great as those of peaches and over twice those of apricots.

It is probably feasible to expand markets for fresh pears somewhat in the next few years by wider and more efficient distribution, but the limited facts available regarding such possibilities seem to indicate

that it is unlikely that improvements in marketing will counteract more than a small part of the lowering of prices promised by the great prospective increase in production. Only a very small increase in the proportion of the price paid by the consumer which is returned to the grower can be expected in the next few years as a result of possible decreases in the cost of marketing. Every reasonable effort, however, should be made to improve growers' returns by this method.

Expansion of foreign markets for fresh pears seems to hold some promise if intelligently effected. There has been a tendency in recent years for our fresh-pear exports, the majority of which are consumed by the United Kingdom, to increase at about the same rate as production and shipments. According to a well-informed student of the British fresh-fruit market it seems probable that we can gradually expand our exports of fresh pears to England in the face of European supplies.<sup>3</sup> The European winter market for our fancy late varieties of pears promises possibilities of gradual expansion. The acreage and production of pears in Canada has been decreasing in the last decade and, as a result, Canadian imports of fresh pears, which practically all come from the United States, have been increasing appreciably.

Since average prices will probably be lower in the next few years, it behooves all growers who can possibly do so to reduce their costs of production. Growers in localities not well adapted to producing high yields of pears per acre or quality of sufficient superiority to offset low yields should carefully consider possible supplementary enterprises whereby they may increase their income by drawing a larger proportion of it from sources likely to be more remunerative than pears. Apparently growers who are largely dependent upon pears for their income and who cannot make a living from pear production at lower prices will be forced to discontinue farming for themselves, unless they can quickly substitute crops capable of bringing them a living, or else supplement their farm income by wages earned elsewhere.

#### GENERAL OBJECT OF THE STUDY

The economic status of the pear industry directly or indirectly influences the prosperity of many persons, organizations, and communities in California. Growers, marketing organizations, bankers, transportation companies, and other agencies serving the pear industry are all keenly interested in knowing what the pear crop of the state

<sup>3</sup> Edwin Smith, Fruit Marketing Specialist of the U. S. Department of Agriculture, stationed in Europe; see U. S. Bureau Agricultural Economics, *Foreign News on Apples* (mimeo.), 52:6. 1926. See discussion on page 45.

promises in a financial way. The present study has as its general objective the assembling, evaluation, and analysis of the chief available statistical data relating to the industry, as a basis for a partial and tentative answer to the question, "What is the economic situation of, and the outlook for, the pear industry in California?" The conclusions drawn are largely based upon available statistics on acreage, production, shipments, canned and dried output, unloads, cold-storage holdings, exports, and prices. The necessity of a study of certain other facts in shaping a comprehensive program of readjustment has been called to the reader's attention. Conclusions drawn from the limited data available can, in a number of instances, be considered only as partial and tentative answers to questions the solution of which are of the utmost importance to the future of the industry.

The scope and content of the study have of necessity been limited by the fact that it is largely based on the more readily available published and unpublished statistical information. On this account, a discussion of certain major problems of the industry are omitted entirely. Lack of sufficient available data as a basis for drawing worth-while conclusions regarding problems of market distribution has made it necessary to omit a study of this important economic phase of the industry from the present publication. There is urgent need for intensive studies of several important pear-marketing problems, as well as a study of the factors influencing the demand for pears. At the present time, however, the means are not available for making such extensive first-hand studies.

The aim of this publication has been to present the available statistics in such a manner as to lead those interested in pear production to a better understanding of the existing economic situation of the industry and the present and future problems. Hence, it is believed, that this study should result in a more rapid and effective solution of the problems now confronting the industry or likely to confront it in the near future.

#### CHIEF PEAR-PRODUCING SECTIONS OF THE UNITED STATES

*Commercial Production Largely Concentrated in Two Sections.*—Figure 1 and table 30 (p. 101) show that production in the United States is largely concentrated in two general sections: (1) west of the Rockies, in the three Pacific Coast states, and (2) east of the Mississippi River in the group of states bordering on the Great Lakes—Illinois, Indiana, Michigan, Ohio, Pennsylvania, and New York—and, touching these on the east and fronting on the Atlantic, the states

of New Jersey, Delaware, Maryland, and Virginia. In 1925 over four-fifths of the total pear acreage of the country was to be found in these two sections. In recent years they produced approximately the same proportion of the national pear crop and were the source of well over 95 per cent of carlot shipments and of practically all the commercial pack of canned and of dried pears. Outside of these two general areas, Texas and Missouri are the only states which individually have been of even minor importance in the pear industry of the country in recent years.

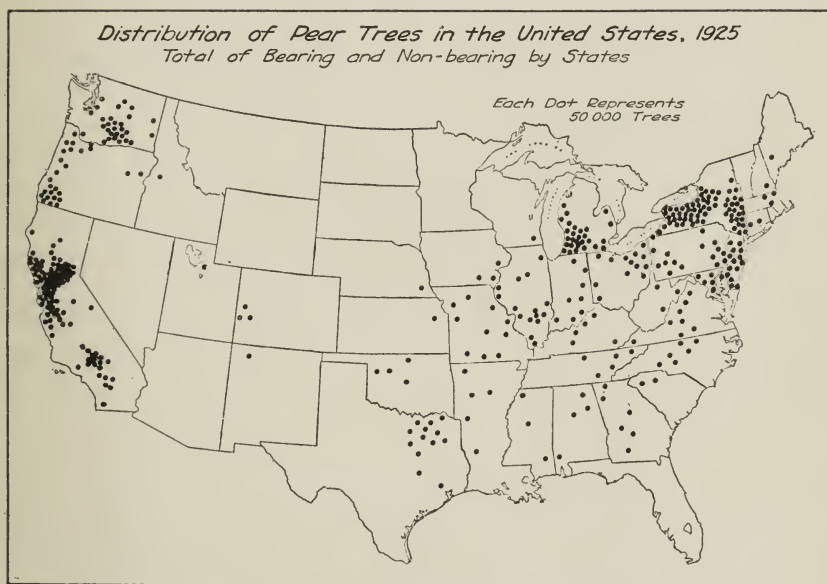


Fig. 1.—Commercial pear production in the United States is largely concentrated in two general sections: (1) west of the Rocky Mountains in the Pacific Coast states and (2) east of the Mississippi River in the states bordering on the Great Lakes and in those on the central Atlantic Coast touching these on the east.

(Data from same source as those in table 3.)

Local concentration of commercial pear production within these two sections is found in a few relatively small areas. The most important of these areas are in the Hudson River Valley and in the lake-shore counties of New York, in southwestern Michigan, in central California, in the Rogue River Valley of Oregon, and in the Yakima Valley of Washington. The rather scattered distribution of the industry elsewhere in the country may be seen by reference to figure 1.

*Relative Importance of Different Section.*—The concentration of the industry in a few states is shown by the fact that in recent years the four states of California, Washington, Oregon, and New York (the one outstanding eastern producer) have accounted for nearly 60 per cent of the pear acreage in the United States, about 63 per cent of the production, over 86 per cent of earlot shipments, over 90 per cent of the total canned-pear pack, and all of the commercial output of dried pears.

The pear output of the **Pacific Northwest** has been very large in recent years and has been increasing rapidly. In 1925 slightly over 12 per cent of the pear trees in the United States were in the two States of Oregon and Washington. During the years 1924–1926 they produced an average of about 4 million bushels of pears or over 18 per cent of the national crop, while their shipments of nearly 5,900 cars a year accounted for over 28 per cent of the earlot movement of fresh pears. During the same period the two states contributed approximately 35 per cent of the national pack of canned pears.

The importance of **California** in the pear industry may be judged by the fact that this one state contained nearly one-third of the 23 million pear trees in the United States in 1925. During the three years 1924–1926, the state produced over one-third of the total pear crop—averaging 7.3 million bushels (about 176,000 tons), compared with a national total of 21.7 million bushels (over 520,000 tons). In spite of the fact that over 60 per cent of the canned-pear pack of the country was supplied by California during this period, the interstate shipments of pears from this state for consumption in a fresh form averaged slightly over 7,800 earloads, or approximately 40 per cent of the national movement.<sup>4</sup> In addition, the state packed practically all of the commercial output of dried pears in the United States.

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<sup>4</sup> Figure 24, page 83, exhibits the canned-pear pack by chief states in 1925; table 32, page 103, United States pear shipments by chief states and sections; and table 13, page 54, interstate shipments of pears for fresh consumption from California in recent years. California is the only state for which data are available showing pear shipments designed for fresh consumption separate from those which go to commercial canneries. All earlot shipments of fresh pears are included in table 32 regardless of their use. No exact estimate, therefore, can be made of the proportion which California shipments of pears for consumption in a fresh form constitute of the national total shipped for such use. It should also be remembered that there is probably a heavy commercial movement of fresh pears by motor truck into many large consuming centers located near eastern pear-producing sections. Judging by the small proportion that total earlot shipments bear to the estimated production of such states as Pennsylvania, New Jersey, and Michigan, this movement by truck is, without doubt, substantial. See Oley, R. C. Transportation of New Jersey's fruits and vegetables by truck. New Jersey Dept. Agr., Bur. Stat. and Inspection, Cir. 99: 1–24. 1926.

GEOGRAPHICAL DISTRIBUTION OF CHIEF VARIETIES<sup>5</sup>

In a survey of the chief varieties of pears produced in the United States, Brown found the Bartlett in 1925 the dominant variety in most commercial producing sections. In non-commercial producing sections, particularly in the south, he found that the hardy sand-pear hybrids comprised the majority of trees, the Kieffer predominating, with the Garber and LeConte varieties ranking next in importance. In several commercial producing sections in the east, however, he found that the Kieffer held first place because it is more resistant to blight than varieties like the Bartlett and others with eating qualities much superior to the Kieffer.

*Bartlett and Kieffer are Chief Eastern Varieties.*—It is estimated that in Pennsylvania, the Bartlett and Kieffer are fairly evenly divided. The Bartlett is the leading variety in New York, followed by Kieffer, Seckel, Clapp's Favorite, Bose, Anjou, Clairgeau and Duchess, approximately in the order named. Between 50 and 60 per cent of the crop of western New York is estimated to be Bartletts, but in the Hudson River section this variety constitutes only about one-third of the acreage. Texas is the only southern state that grows Bartletts commercially. In the irrigated region around Clint and Ysleta, near El Paso, nearly 60 per cent of the pear crop is Bartletts. In the other pear-growing sections of the state the Kieffer is the leading variety.

A large majority of the pears produced in New Jersey, Delaware, Maryland, and Virginia and a smaller majority in Illinois, Indiana, and Michigan are Kieffers. Kieffers constitute about 60 per cent of the pear crop of New Jersey, and Bartletts nearly 20 per cent, the remainder being composed principally of LeConte, Duchess, and Seckel. In Delaware about 90 per cent of the output is Kieffers. Bartlett, LeConte, Seckel, and Duchess make up the greater part of the balance. About 85 per cent of the pear acreage of Illinois is planted to Kieffers and a large majority of the pear shipments are of this variety. In Michigan the Kieffer constitutes nearly 60 per

<sup>5</sup> This discussion of the geographical distribution of the chief varieties of pears grown in the United States is largely based on statements from the following sources: Brown, W. S. The economic status of the pear industry. Oregon State Hort. Society, 17th Annual Report (for 1925), pp. 77-78. 1926; Gould, H. P., and Frank Andrews. Pears: Production estimates and important commercial districts and varieties. U. S. Dept. Agr., Bul. 822: 5-16. 1922; Fraser, Samuel. American fruits. p. 371-372. Orange Judd Pub. Co., New York, 1925; and the mimeographed pear deals issued by the U. S. Bureau of Agricultural Economics annually since 1922 or 1923 for each of the states of California, New York, Michigan, and Colorado.

cent of the pear acreage and Bartletts about 20 per cent. The balance is largely composed of Seckel, Clapp, Clairgeau, Bose, Anjou, Sheldon, and Duchess, listed approximately in the order of their importance.

*Trend in Varieties Planted in the East.*—Throughout New Jersey, Delaware, Maryland, and the southern and middle-western states, Brown reports that the Kieffer will probably continue to dominate new plantings until varieties or stocks can be developed having better quality or more resistance to blight. In New York, New England, and Michigan, however, the Kieffer is reported to be gradually losing its popularity and is apparently being supplanted to some extent by pears of better eating quality. In New England the Bose is said to be the leader in popularity for new plantings and appears to be gaining somewhat in New York, along with Clapp's Favorite, Sheldon, and Winter Nelis. The Bartlett, however, is reported as the probable leader in future plantings, in both the western and the eastern part of the state. It seems likely that the Seckel will maintain considerable of its present importance.

*Bartletts Lead West of Rockies.*—West of the Rocky Mountains the Bartlett leads in commercial output in every state except Colorado, which is the only far western state in which the Kieffer is of commercial importance. It is estimated that about half of the pear tonnage of this state is of this variety and 35 to 40 per cent Bartletts. The remainder is made up chiefly of Clapps Favorite, Anjou, and Flemish Beauty. It is estimated that between 40 and 50 per cent of the production of Oregon is composed of Bartletts, with the balance divided among Bose, Anjou, Comice, Winter Nelis, and a few others. According to the results of a survey, completed in 1926,<sup>6</sup> of the number of pear trees of bearing and non-bearing age by varieties in the Yakima Valley district, the chief pear-producing section of Washington, approximately 70 per cent of the total acreage is in Bartletts, about 18 per cent in Winter Nelis, 5 per cent in Anjou, 3 per cent in Bose, and the remainder largely in Flemish Beauty and Comice.

*Trend of Varieties on Pacific Coast.*—The percentage of non-bearing to the total number of trees by varieties in Washington indicates that the Bose, Flemish Beauty, and Bartlett varieties should constitute a slightly increased proportion of the output of the Yakima Valley district in the next few years. Consequently the proportion of Anjou, Comice, and Winter Nelis will decrease although their production will probably increase somewhat.

<sup>6</sup> The results of this survey for the northeast, the southeast, and the Yakima Valley districts are given in table 5 in Morris, O. M., and M. D. Armstrong. Washington agriculture, part 8, horticulture [pears, peaches, prunes, cherries, and apricots]. Washington State Col. Ext. Bul. 134: 14. 1926.

It seems probable that the proportion of late varieties of pears grown in Oregon is on the increase chiefly as the result of the high prices which have been received for the best of these varieties in the last decade compared with Bartletts<sup>7</sup> and partly as a result of recommendations made by the agricultural economic conferences which have been held in the state in the last three years. The general opinion emanating from these conferences has been that in view of the big plantings of Bartletts in Washington and California, it seems rather inadvisable at present to plant Bartletts extensively in Oregon. In sections of the state especially adapted to pear culture, moderate, but not large, increases in winter pears may be desirable.<sup>8</sup>

TABLE 1

NEW YORK DELIVERED-AUCTION SALES OF OREGON PEARS BY CHIEF VARIETIES  
AND OF CALIFORNIA BARTLETTS, 1917-1926  
Number of boxes, seasons through December 31.

| Year  | California<br>Bartlett | Oregon    |                                    |         |         |                 |        |
|-------|------------------------|-----------|------------------------------------|---------|---------|-----------------|--------|
|       |                        | Bartletts | Total of<br>four late<br>varieties | Bosc    | Anjou   | Winter<br>Nelis | Comice |
| 1917  | 687,426                | 54,239    | 61,702                             | 16,760  | 18,642  | 18,225          | 8,075  |
| 1918  | 663,157                | 35,538    | 78,814                             | 21,290  | 22,935  | 18,671          | 15,918 |
| 1919  | 623,861                | 38,360    | 112,338                            | 23,387  | 49,916  | 19,570          | 19,465 |
| 1920  | 672,710                | 41,438    | 103,125                            | 37,870  | 31,800  | 18,400          | 15,055 |
| 1921  | 661,857                | 63,022    | 119,385                            | 44,935  | 36,860  | 27,378          | 10,212 |
| 1922  | 940,112                | 40,585    | 259,075                            | 108,015 | 59,095  | 58,885          | 33,080 |
| 1923  | 959,967                | 106,471   | 270,374                            | 90,535  | 100,720 | 52,584          | 26,535 |
| 1924  | 836,927                | 42,860    | 168,397                            | 94,525  | 39,766  | 10,934          | 23,172 |
| 1925  | 1,080,000              | 92,845    | 198,000                            | 68,000  | 87,000  | 23,000          | 20,000 |
| 1926  | 1,403,000              | 78,180    | 334,000                            | 165,000 | 113,000 | 6,000           | 50,000 |
| 1927  | 1,203,000              |           |                                    |         |         |                 |        |
| 1928* |                        |           |                                    |         |         |                 |        |

\* A space is left for 1928 figures in this and certain subsequent tables, for the use of those who wish to insert them when they become available.

Sources of data: Years 1917-1924 compiled by the Stewart Fruit Co. from the New York Daily Fruit Reporter. Years 1925-1926 compiled from same source by author, to nearest thousand boxes.

In recent years, at least, a considerable quantity of both Anjou and Winter Nelis have been sold during the months of January through May. A comparable series of figures for these late sales are, however, not available. From January to May inclusive, 1926, approximately 46,000 boxes of Winter Nelis and 41,000 boxes of Anjou were sold at delivered auctions in New York City.

<sup>7</sup> See discussion on page 24.

<sup>8</sup> Oregon Agricultural Economic Conference, Report of Jan. 23-25, 1924. Oregon Agr. Col. Ext. Bul. 393: 30. April, 1924. See also: Jackson County Agricultural Conference. Report suggesting an agricultural program for Jackson County. Oregon Agr. Col. Ext. Ser. Bul. (unnumbered and unpagged). Printed and distributed by the county agriculture agent, Medford, Oregon, 1924. A similar report, part of which deals with pears, was prepared in Hood River County, Oregon.

Brown, however, states that undoubtedly the Bartlett will continue to be a favorite for planting as long as cannery prices remain as good as they have recently been. He also says that Clairegeau, Comice, and Anjou do not seem to be as popular as formerly, but Bose and Winter Nelis are on the increase. A study of table 1, showing the changes in the volume of New York delivered-auction sales of the four chief varieties of late pears grown in Oregon seems to indicate that the output of the Anjou and the Bose has been increasing steadily and rapidly since 1917, whereas that of the Comice has increased very slowly. Winter Nelis seems to show a decline, although it is probable that the sales as reported to December 31 only of each year are not a fair index of the trend of output of this variety and of the Anjou in Oregon, since a considerable percentage of these two varieties move into consumption after the first of January.

*Sales of Pacific Coast Late Varieties at New York.*—Available data on delivered-auction sales of late varieties of Pacific Coast pears in New York City in recent years give a clue to the relative importance of these varieties in this section. They indicate that the following, named approximately in the order of their importance, are the chief varieties produced on the coast: Winter Nelis, Anjou, Bose, Comice, Beurre Hardy, Clairegeau, Easter Beurre, and Flemish. (See fig. 2 and table 1, and table 36, p. 107.) The first three of these varieties, as a group, apparently constitute over half of the delivered-auction sales of late varieties of Pacific Coast pears in New York.

Practically all Bose, Comice, Clairegeau, Beurre Hardy, and Flemish are sold before Christmas and a substantial majority of Anjou.<sup>9</sup> Probably a half or more of the Winter Nelis are sold during the period from Christmas to late in May. The pear from the Coast which is held the longest appears to be the Easter Beurre, over 30,000 boxes of which were sold in New York City in the spring of 1926.

About one-third of the New York auction sales of late varieties of Pacific Coast pears originate in California. Winter Nelis, Beurre Hardy, Comice, Clairegeau, Easter Beurre, and Glout Moreeau, named approximately in the order of their importance, constitute a large majority of California shipments of late pears. Winter Nelis and Beurre Hardy together make up about one-half.

A large majority of the Bose and over half of the Anjou sales from the Pacific Coast originate in Oregon. Comice and Winter Nelis are the only other late varieties of pears of much importance in

<sup>9</sup> See pages 70-75 for a discussion of seasonal variation in sales of the chief Pacific Coast late varieties on the New York delivered auctions in 1926.

Oregon. The Winter Nelis, however, is much more important in Washington, where it is the chief variety grown, with Anjou second. Washington produces practically all of the Flemish Beauty variety grown on the Pacific Coast. The output of this variety is relatively small but is gradually increasing.

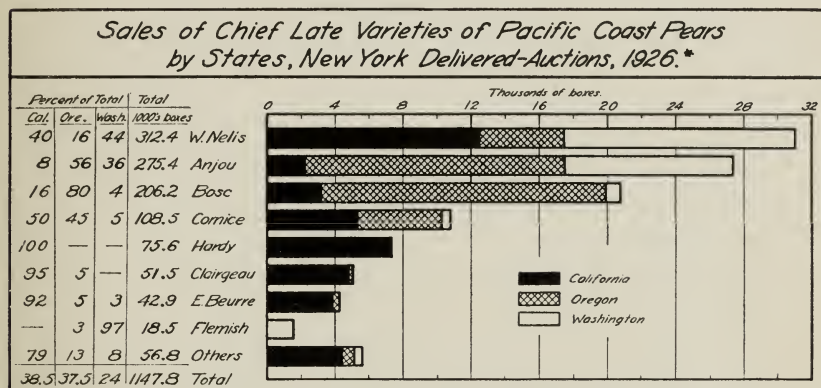


Fig. 2.—Winter Nelis, Anjou, and Bosc, the most important late varieties grown on the Pacific Coast constitute over half of the late pear crop of this section. A majority of Bosc and Anjou and a considerable volume of Comice come from Oregon. California produces Winter Nelis, Beurre Hardy, Comice, Clairgeau, and Easter Beurre in large quantities. Anjou, Winter Nelis, and Flemish are important in Washington.

(Data are for the calendar year 1926 and are from table 36, page 107.)

*Status and Trend of Variety Plantings in California.*—The results of a valuable survey by the California Cooperative Crop Reporting Service of the pear acreage in the state by varieties and ages, which are shown in table 2, give an excellent basis for visualizing the relative importance of the acreage of the chief varieties grown in the state at the present time and the probable changes in relative importance in the near future. Approximately 88 per cent of the total pear acreage of all ages in the state is composed of Bartletts and the remaining 12 per cent of fall and winter varieties. The tendency for plantings of fall and winter varieties to increase, relative to those of Bartletts, is shown by the fact that only 6 per cent of the state acreage of pears 11 years or older is composed of late varieties, whereas 8 per cent of the 6 to 10-year-old trees, and 20 per cent of those less than 6 years old, are fall and winter varieties.

Of the total acreage of these late varieties in 1927, 24 per cent are Hardy, 22 per cent Winter Nelis, 16 per cent Bosc, and 8 per cent Anjou. Clairgeau and Easter Beurre each constitute 7 per cent and

TABLE 2  
ESTIMATED ACREAGE OF CALIFORNIA PEARS BY VARIETY AND BY AGE, 1927

| Variety                             | 1926<br>Plant-<br>ings | Age of trees in years |       |       |       |       |       |       |       |       |       |       |          | Totals by<br>varieties |          |                   |        |             |   |
|-------------------------------------|------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------------------------|----------|-------------------|--------|-------------|---|
|                                     |                        | 2                     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13 to 17 | 18 to 22               | 23 to 27 | 28<br>and<br>over | Acres  | Per<br>cent |   |
|                                     |                        |                       |       |       |       |       |       |       |       |       |       |       |          |                        |          |                   |        |             |   |
| Beurre Anjou.....                   | 30                     | 60                    | 33    | 107   | 44    | 68    | 56    | 10    | 56    | 51    | 85    | 73    | 125      |                        |          | 1                 | 20     | 819         | 8 |
| Beurre Hardy*                       | 387                    | 563                   | 363   | 463   | 334   | 78    | 129   | 29    | 47    | 45    | 81    | 4     | 23       | 11                     | 1        | 43                | 2,601  | 24          |   |
| Beurre Bosc.....                    | 227                    | 414                   | 264   | 175   | 149   | 116   | 143   | 43    | 30    | 18    | 77    | 24    | 41       | 0                      | 0        | 4                 | 1,725  | 16          |   |
| Beurre Clairgeau.....               | 17                     | 5                     | 43    | 109   | 114   | 48    | 69    | 13    | 23    | 18    | 26    | 68    | 75       | 11                     | 0        | 85                | 724    | 7           |   |
| Comice.....                         | 50                     | 4                     | 19    | 77    | 48    | 36    | 53    | 15    | 47    | 13    | 118   | 37    | 175      | 2                      | 5        | 7                 | 706    | 6           |   |
| Easter Beurre.....                  | 134                    | 178                   | 125   | 167   | 53    | 13    | 31    | 6     |       |       | 4     | 1     | 37       | 7                      |          | 41                | 797    | 7           |   |
| Winter Nellis.....                  | 184                    | 204                   | 284   | 272   | 333   | 183   | 135   | 88    | 51    | 110   | 116   | 59    | 200      | 50                     | 39       | 144               | 2,452  | 22          |   |
| All others.....                     | 114                    | 107                   | 121   | 92    | 117   | 39    | 58    | 20    | 33    | 20    | 86    | 55    | 78       | 54                     | 14       | 131               | 1,139  | 10          |   |
| Fall and winter varieties.....      | 1,143                  | 1,535                 | 1,252 | 1,462 | 1,192 | 581   | 674   | 224   | 287   | 275   | 593   | 321   | 754      | 135                    | 60       | 475               | 10,963 | 100         |   |
| Bartlett's.....                     | 4,301                  | 5,154                 | 5,076 | 5,619 | 6,483 | 5,376 | 4,701 | 4,402 | 3,499 | 4,284 | 5,116 | 4,950 | 10,701   | 3,060                  | 2,047    | 8,718             | 83,487 |             |   |
| Grand total.....                    | 5,444                  | 6,689                 | 6,328 | 7,081 | 7,675 | 5,957 | 5,375 | 4,626 | 3,786 | 4,569 | 5,709 | 5,271 | 11,455   | 3,195                  | 2,107    | 9,193             | 94,450 |             |   |
| Per cent of total in each age group |                        |                       |       |       |       |       |       |       |       |       |       |       |          |                        |          |                   |        |             |   |
| Fall and winter varieties.....      | 21                     | 23                    | 20    | 21    | 16    | 10    | 12    | 5     | 8     | 6     | 10    | 6     | 7        | 4                      | 3        | 5                 | 12     |             |   |
| Bartlett's.....                     | 79                     | 77                    | 80    | 79    | 84    | 90    | 88    | 95    | 92    | 94    | 90    | 94    | 93       | 96                     | 97       | 95                | 88     |             |   |

\* Some of the recent plantings of Beurre Hardy will later be grafted to other varieties.

From a survey made by N. I. Nielsen of the California Co-operative Crop Reporting Service and reported in Kaufman, E. E. California Crop Report for 1926, Calif. Dept. Agr. Spec. Pub. 74 : 38, 1927.

Comice 6 per cent, while other varieties as a group make up the balance of 10 per cent of the acreage of all late varieties.<sup>10</sup> The relative plantings of Anjou, Clairgeau, and Comice have declined in the last decade. They constitute 39 per cent of the total acreage of late varieties 11 years of age and over, and only 21 per cent for all ages. Winter Nelis also shows a relative decline as the percentages corresponding to these age groups are 26 and 22 respectively. In the case of the group of unnamed miscellaneous varieties the same tendency is shown by the percentages 18 and 10 respectively. The relative decline in the four varieties mentioned above and the unnamed miscellaneous varieties is indicated by the fact that as a group they account for 83 per cent of the acreage of late varieties 11 years or older, whereas they constitute only 53 per cent of the acreage of all ages.

Each of the three late varieties—Hardy, Clairgeau, and Easter Beurre—constitutes an increased proportion of the plantings of the last decade. Whereas the three constitute but 27 per cent of the acreage of late varieties 11 years or older, they account for 47 per cent of the total acreage of all ages. Bosc and Beurre Hardy have both become more popular. Only 6 per cent of the acreage of late varieties in the older age group are Bosc, compared with 16 per cent of that of all ages. The corresponding figures for Beurre Hardy are 17 and 24, respectively. Nielsen,<sup>11</sup> however, in making his survey of the pear acreage of the state, found that some growers intended to graft their recent Beurre Hardy plantings to other varieties.

#### TREND OF PRODUCTION IN CHIEF SECTIONS

##### *Growth of Commercial Acreage and Decline in Non-Commercial.—*

The growth of the pear industry in the United States from 1910 to 1920 is best visualized by the increase in the number of bearing pear trees as recorded by the Federal Census Bureau.<sup>12</sup> Table 3 shows that during this decade pear production was increasing rapidly in

<sup>10</sup> This miscellaneous group of "late" varieties includes a number of early pears, a few of which are grown in California. The more important of these, judging from delivered-auction sales, are Madeleine, Lawson (Comet), Wilder, and Clapps Favorite, which ripen in June and July.

<sup>11</sup> Kaufman, E. E. California crop report for 1926. California Dept. Agr., Spec. Pub. 74: 38. 1927.

<sup>12</sup> The trend of bearing acreage indicated by the Federal Censuses of 1910 and 1920 for the Pacific Coast, and particularly for California, differs greatly from the trend of the production estimates of the Federal Crop Reporting Service from 1910 to 1916. Other fairly reliable data for the Pacific Coast confirm the general trend of bearing acreage indicated by the Census data and hence the federal crop estimates of pear production have not been used for the years 1910 to 1916. The author has revised the estimates for California only. These appear in tables 5, p. 27, and 30, p. 101.

TABLE 3  
PEAR TREES IN THE UNITED STATES BY CHIEF STATES AND GROUPS, 1910, 1920, AND 1925

| State or group    | 1910       |             |                               | 1920       |                        |             | 1925                          |                        |                               |
|-------------------|------------|-------------|-------------------------------|------------|------------------------|-------------|-------------------------------|------------------------|-------------------------------|
|                   | Bearing    | Non-bearing | Total bearing and non-bearing | Bearing    |                        | Non-bearing | Total bearing and non-bearing |                        | Total bearing and non-bearing |
|                   |            |             |                               | Number     | Per cent of U.S. total |             | Number                        | Per cent of U.S. total |                               |
| California.....   | 1,410,905  | 398,093     | 1,808,998                     | 2,305,646  | 163                    | 2,178,526   | 4,484,172                     | 21.6                   | 7,397,456                     |
| New York.....     | 2,141,596  | 1,502,661   | 3,644,257                     | 2,778,761  | 131                    | 967,573     | 3,746,334                     | 18.1                   | 3,331,601                     |
| Washington.....   | 290,676    | 617,754     | 908,430                       | 866,684    | 298                    | 183,346     | 1,049,980                     | 116                    | 1,476,093                     |
| Oregon.....       | 273,542    | 795,669     | 1,069,211                     | 727,444    | 266                    | 214,523     | 941,967                       | 88                     | 1,314,131                     |
| Michigan.....     | 1,136,151  | 623,931     | 1,760,082                     | 1,029,735  | 91                     | 302,734     | 1,332,469                     | 76                     | 1,249,246                     |
| Pennsylvania..... | 796,882    | 382,180     | 1,179,062                     | 753,632    | 95                     | 237,643     | 991,275                       | 84                     | 855,634                       |
| Illinois.....     | 786,349    | 234,037     | 1,020,386                     | 435,707    | 56                     | 148,810     | 584,517                       | 58                     | 767,671                       |
| Ohio.....         | 899,019    | 333,739     | 1,232,758                     | 616,416    | 69                     | 147,892     | 764,308                       | 62                     | 687,771                       |
| Texas.....        | 588,478    | 448,899     | 1,037,377                     | 435,684    | 78                     | 182,394     | 618,078                       | 65                     | 680,000                       |
| Missouri.....     | 606,973    | 272,213     | 879,186                       | 376,208    | 62                     | 101,994     | 478,202                       | 54                     | 480,878                       |
| New Jersey.....   | 731,616    | 238,401     | 970,017                       | 480,601    | 67                     | 77,026      | 557,627                       | 45                     | 431,799                       |
| Virginia.....     | 457,177    | 255,083     | 712,260                       | 311,199    | 68                     | 79,561      | 390,760                       | 57                     | 404,800                       |
| Indiana.....      | 708,723    | 229,548     | 938,271                       | 337,515    | 48                     | 68,150      | 405,665                       | 41                     | 388,394                       |
| Maryland.....     | 540,583    | 138,152     | 678,735                       | 305,510    | 57                     | 48,918      | 354,428                       | 42                     | 285,981                       |
| Delaware.....     | 449,692    | 90,917      | 540,609                       | 249,375    | 56                     | 26,575      | 275,950                       | 38                     | 205,501                       |
| Colorado.....     | 99,989     | 171,367     | 271,356                       | 136,117    | 136                    | 39,979      | 176,096                       | 69                     | 186,244                       |
| Utah.....         | 79,355     | 39,901      | 119,256                       | 51,812     | 66                     | 8,479       | 60,291                        | 50                     | 59,903                        |
| Group—A.....      | 11,967,706 | 6,772,545   | 18,740,251                    | 12,197,996 | 102                    | 5,014,123   | 17,212,119                    | 108                    | 20,173,103                    |
| B.....            | 3,203,818  | 2,031,340   | 5,235,158                     | 2,449,416  | 77                     | 1,038,124   | 3,487,540                     | 54                     | 2,826,897                     |
| C.....            | 6,139,208  | 4,343,912   | 10,483,120                    | 8,280,044  | 135                    | 4,035,491   | 12,315,535                    | 150                    | 15,722,442                    |
| D.....            | 1,975,123  | 1,811,516   | 3,786,639                     | 3,899,724  | 197                    | 2,576,395   | 6,476,119                     | 171                    | 10,187,680                    |
| E.....            | 13,196,401 | 6,992,369   | 20,188,770                    | 10,747,688 | 82                     | 3,475,852   | 14,223,540                    | 71                     | 12,812,320                    |
| F.....            | 564,218    | 1,413,423   | 1,977,641                     | 1,594,078  | 283                    | 397,869     | 1,991,947                     | 101                    | 2,790,224                     |
| Total U. S.....   | 16,171,524 | 8,803,885   | 23,975,409                    | 14,647,412 | 93                     | 6,062,247   | 20,699,659                    | 86                     | 23,198,479                    |

† The states included in the group totals listed above are as follows:

A—Total of 17 states listed separately in the table;

B—Total of all other states;

C—Total of the seven chief pear-shipping states—California, New York, Washington, Oregon, Michigan, Illinois, and Colorado;

D—Total for the Pacific Coast states—California, Washington, and Oregon;

E—United States total minus the Pacific Coast states in group D;

F—Total of two Pacific-northwest states—Washington and Oregon.

Sources of data: Data for 1910 and 1920 from U. S. Census Bureau, Report of 14th U. S. Census, 1920, Vol. 5, Agriculture; 865; for 1925 compiled from bulletins of the U. S. Census of Agriculture, 1925 for each of the states. Percentage data computed by the author.

the three Pacific Coast states only. A slight increase, however, was recorded in Colorado and also in New York, the only state east of the Rockies showing any increase whatever in pear acreage. During the same period, however, the bearing trees in every other state showed a noticeable decline, the number in this group of states being nearly 30 per cent less in 1920 than in 1910.

*Increase in Total and in Commercial Production.*—Although the total number of bearing pear trees in the United States in 1920 was not quite so great as in 1910, the total pear crop, and particularly the *commercial* output, actually expanded appreciably during this decade. This increased output came about mainly because the decrease of about 2.5 million bearing trees which occurred east of the Rocky Mountain, chiefly in low-yielding, non-commercial producing areas, was replaced in large part by heavy-yielding, commercial orchards. Much of the new commercial producing area is on the Pacific Coast.

*Rapid Expansion on Pacific Coast.*—Expansion of the commercial pear industry between 1910 and 1920 took place most rapidly on the Pacific Coast. The bearing acreage of trees in this section practically doubled in this decade (table 3). The 3.9 million bearing pear trees in the Pacific Coast states in 1920 were 1.9 million more than in 1910, constituting nearly 27 per cent of the national total of bearing trees, compared with only 13 per cent in 1910. About one-half of this increase occurred in Oregon and Washington and the other half in California. While the number of bearing trees in New York and Colorado in 1920 was only about  $1\frac{1}{3}$  times the number in 1910, in California the number was  $1\frac{2}{3}$  times as great in 1920 as in 1910, in Oregon it was about  $2\frac{2}{3}$  times as great, and in Washington practically 3 times as great.

#### FORECAST OF PRODUCTION FOR CHIEF SECTIONS

*Purpose, Basis, and Limitations of Forecast.*—Since the chief factor affecting the trend of pear prices in the next few years will probably be the supplies available for the market, California pear growers are interested in the probable trend of production in the United States and particularly on the Pacific Coast. It is rather generally recognized that a substantial increase in production may be expected on the Pacific Coast, but no quantitative forecasts for this section or for the United States as a whole seem to be available.<sup>13</sup>

<sup>13</sup> California is the only state for which fairly reliable estimates of the bearing and non-bearing acreage of pears and of other important tree-fruits is available for a series of years. (See tables 5, p. 27, and 34, p. 105, for these pear data for California.) One of the most needed improvements in estimating tree-fruit production in most other states is an adequate and reliable statistical base for determining the *trend* of production of each fruit.

## Rate of Change in Pear Production, Shipments, and Bearing Trees

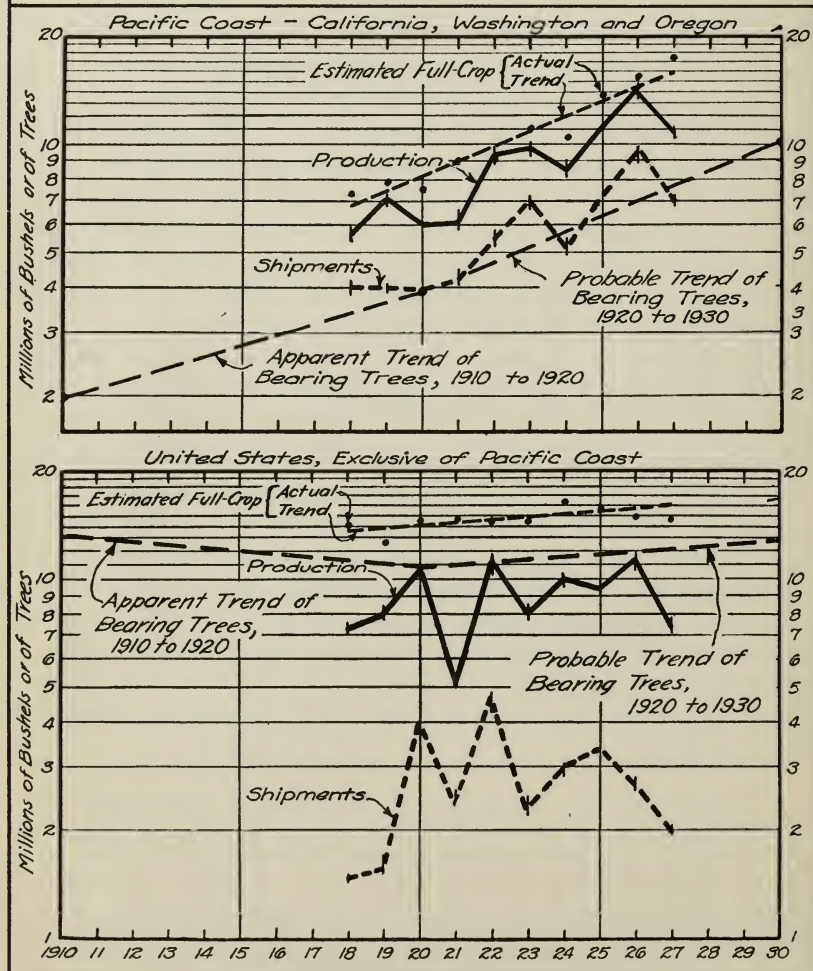


Fig. 3.—The data pictured above have been used as the basis of the forecast of probable average pear production discussed in the text. In estimating the probable trend of increase in the number of bearing trees from 1920 to 1930 it is assumed that the number of bearing trees in 1930 will be approximately equal to the total number of bearing and non-bearing trees reported in 1925 by the Federal Agricultural Census.

(Data from table 3, page 20, table 4, page 25, table 30, page 101, and table 32, page 103.)

However, a careful study of the data from federal sources pictured in figure 3, together with supplementary data on the pear acreage of the three Pacific Coast states drawn from state sources, seems to justify the forecasts of production which are given in the following discussion.<sup>14</sup>

*Trend on Pacific Coast compared with All Other States.*—During the last decade the production and bearing acreage of pears have increased much more rapidly on the Pacific Coast than in the rest of the United States, and apparently they will continue to do so for several years. On the Pacific Coast, both bearing acreage and production have been increasing about 10 per cent each year, although in the rest of the United States they have increased at a rate of less than 2 per cent a year since 1918. Figure 3 indicates that apparently the trend of bearing acreage and production in each of these sections will continue upward at about these same rates until 1930, at least. If this should occur, the average pear crop of the three Pacific Coast states, which was somewhat over 11 million bushels (about 275,000 tons) for 1924–1926, will be about 18 million bushels (nearly 450,000 tons) in the three-year period centering in 1930.<sup>15</sup> The production of the

<sup>14</sup> *Significance of Semi-Logarithmic or Ratio Charts.*—In picturing statistical data one frequently wishes to emphasize comparisons of percentage or proportional changes rather than absolute amounts. For the purpose of showing such relative changes a ratio scale, such as the vertical scale in figure 3, is most useful. Equal vertical distances on the semi-logarithmic paper on which the figure is plotted picture equal percentages (rates) of change. For convenience in plotting and reading, however, the scale has been numbered in actual bushels. With the usual or arithmetic scale on ordinary cross-section paper, such as was used in figure 16, the distance between the vertical lines 2 and 4 is pictured as twice as great as the distance from 1 to 2. In figure 3, however, which is plotted on semi-logarithmic paper, the vertical distance from 2 to 4 is just equal to the distance from 1 to 2 for the reason that 2 bears the same relationship to 4 that 1 does to 2. It is obvious that 2 is twice as great as 1; in other words, 2 is 100 per cent greater than 1. Likewise, 4 is twice as great as 2; or, in other words, 4 is 100 per cent greater. Equal distances on the scale correspond to equal relative or percentage changes, and not, as in figure 16, page 59, to equal differences in the absolute number of boxes. Equal percentage increases over a series of years, when plotted on semi-logarithmic paper, are shown as a straight line.

<sup>15</sup> The term 'average production' as used in this discussion refers to the probable size of crop, the one which would be produced if yields per bearing acre remained the same as the average in recent years, and full-bearing acreage alone changed. (The actual crop from any given acreage in any particular year is seldom the same as the average. Numerous factors which affect yields, such as weather conditions, pests and diseases, and methods of pruning, spraying, and culture vary from year to year and from place to place.) This concept of average is well illustrated by the 'average' California pear crop for any given year from 1910 to 1926 as indicated by the line of trend fitted to the actual production data pictured in figure 3, page 22. If, in 1931, it were found that the 'average' pear production for 1930 indicated by a line of trend fitted at that time to actual annual production figures through 1931 for a period of ten or fifteen years was somewhere near the forecast of the probable 'average' crop of 1930 which has been made in this study, it would prove this forecast to be reasonably correct.

(Footnote continued at bottom of next page.)

rest of the country may then average slightly more than the 10.4 million bushels (about 250,000 tons) average for 1924–1926. It would not be surprising if the production of pears in the United States averaged about 28 million bushels (about 700,000 tons) by 1930 or 1931. By that time the Pacific Coast, which now produces slightly more than half of the national pear crop, will probably produce nearly 65 per cent.

*Trend in Oregon and Washington.*—California is particularly interested in the pear industry in the Pacific Northwest because this section is her only important competitor in canning Bartlett's and in shipments of fresh Bartlett's to eastern markets in August. Increasing production of fall and winter varieties in the Northwest is also to a considerable extent in direct competition with California pears of this kind. A study of the trend of production and apparent bearing acreage in Washington and in Oregon similar to that made of the Pacific Coast as a whole, indicates that the pear industry is growing at a more rapid rate in Oregon than in Washington. The production in Washington, which has averaged about 2.4 million bushels (nearly 60,000 tons), or about 11 per cent of the national pear crop in the three years 1924–1926, seems to be increasing at the rate of about 10 per cent each year. This rate, if continued, would result in an average crop in the neighborhood of 4 million bushels (nearly 100,000 tons) in the three-year period 1929–1931. Production in Oregon, which has averaged about 1.6 million bushels (nearly 40,000 tons) for the years 1924–1926, or over 7 per cent of the national crop, has

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(Footnote continued from the preceding page.)

It should be clearly understood that this concept of an 'average' crop differs greatly from that of a 'normal' or 'full' crop as used by the Division of Crop Estimates of the United States Department of Agriculture in reporting the percentage which the yield per acre at any given time appears to be of a 'normal' or 'full' crop. The Department of Agriculture states that as used in their crop reports a 'normal' or 'full crop' is "the typical crop represented by the average of a series of *good* crops, leaving out of consideration altogether the occasional bumper crop and more or less frequent partial crop failures. This expected yield at planting time, the full crop that the farmer has in mind when he thinks of the yield that he expects to harvest, or the typical crop represented by the *average of good crops only*, is the 'normal,' or standard adopted by the bureau for expressing conditions during the growing season and yield at harvest time."

For a more complete explanation of this somewhat elusive concept of a 'full' or 'normal' crop—which is seldom realized—see: U. S. Dept. Agr. Government crop reports; their value, scope, and preparation. U. S. Dept. Agr., Bur. Crop Estimates, Cir. 17 (revised): 21. 1915.

During the last 10 years the actual average production of pears in the United States has been only 68.7 per cent of a 'full crop,' on the Pacific Coast 86 per cent, and in California 87 per cent. Study of figure 3 should bring out the difference between the 'average' California pear crop as indicated by the line of trend fitted to the estimates of actual production and the estimates of a 'normal' or 'full' crop shown in table 4.

increased at the rate of about 12 per cent a year since 1918. At this rate the crop average by 1930 (computed on the basis of the crops of 1929-1931) might easily amount to between 2.5 and 3 million bushels (between 60,000 and 75,000 tons).

TABLE 4

ESTIMATED FULL CROPS OF PEARS BY CHIEF STATES AND SECTIONS, 1917-1927

|                               | 1927* | 1926  | 1925 | 1924 | 1923 | 1922  | 1921 | 1920 | 1919 | 1918 | 1917 |
|-------------------------------|-------|-------|------|------|------|-------|------|------|------|------|------|
| <i>United States:</i>         |       |       |      |      |      |       |      |      |      |      |      |
| Per cent of full crop.....    | 56.8  | 83.6  | 70.2 | 70.0 | 68.8 | 86.3  | 48.2 | 82.9 | 68.2 | 62.1 | 68.2 |
| Calculated full crop†.....    | 31.8  | 30.2  | 29.5 | 26.9 | 25.9 | 24.0  | 23.4 | 20.3 | 22.0 | 21.5 | 20.3 |
| <i>Pacific Coast:</i>         |       |       |      |      |      |       |      |      |      |      |      |
| Per cent of full crop.....    | 63.5  | 91.3  | 81.3 | 80.0 | 89.0 | 102.8 | 68.2 | 79.3 | 90.7 | 85.4 | 89.0 |
| Calculated full crop†.....    | 17.0  | 15.3  | 13.9 | 10.6 | 11.0 | 9.1   | 8.9  | 7.6  | 7.9  | 7.3  | 5.9  |
| <i>Washington:</i>            |       |       |      |      |      |       |      |      |      |      |      |
| Per cent of full crop.....    | 41.0  | 90.0  | 75.0 | 80.0 | 89.0 | 80.0  | 80.0 | 71.0 | 85.0 | 90.0 | 85.0 |
| Calculated full crop†.....    | 3.8   | 3.6   | 3.1  | 2.2  | 3.0  | 2.2   | 2.1  | 1.6  | 2.1  | 1.4  | 1.2  |
| <i>Oregon:</i>                |       |       |      |      |      |       |      |      |      |      |      |
| Per cent of full crop.....    | 75.0  | 100.0 | 75.0 | 80.0 | 85.0 | 85.0  | 80.0 | 70.0 | 70.0 | 85.0 | 72.0 |
| Calculated full crop†.....    | 2.5   | 2.1   | 2.0  | 1.5  | 1.9  | 1.6   | 1.0  | 1.1  | 1.1  | 0.8  | 0.8  |
| <i>California:</i>            |       |       |      |      |      |       |      |      |      |      |      |
| Per cent of full crop.....    | 69.0  | 90.0  | 85.0 | 80.0 | 90.0 | 118.0 | 63.0 | 85.0 | 98.0 | 84.1 | 95.0 |
| Calculated full crop†.....    | 10.6  | 9.6   | 8.9  | 6.9  | 6.1  | 5.3   | 5.7  | 4.9  | 4.7  | 5.0  | 3.9  |
| <i>New York:</i>              |       |       |      |      |      |       |      |      |      |      |      |
| Per cent of full crop.....    | 52.0  | 58.0  | 78.0 | 62.0 | 39.0 | 93.0  | 50.0 | 95.0 | 60.0 | 53.0 | 67.0 |
| Calculated full crop†.....    | 3.6   | 3.6   | 3.9  | 3.4  | 2.6  | 3.4   | 3.3  | 2.9  | 3.0  | 2.5  | 2.5  |
| <i>All but Pacific Coast:</i> |       |       |      |      |      |       |      |      |      |      |      |
| Per cent of full crop.....    | 49.2  | 75.7  | 60.3 | 63.6 | 53.8 | 76.3  | 35.6 | 84.9 | 55.7 | 50.2 | 59.3 |
| Calculated full crop†.....    | 14.8  | 14.9  | 15.6 | 16.3 | 14.9 | 14.9  | 14.5 | 12.7 | 14.1 | 14.2 | 14.4 |

\* The calculated full crops for 1927 are based on preliminary production estimates and hence are subject to revision.

† The calculated full crops are given in millions of bushels (i. e., ,000,000 omitted).

Sources of data: Data on per cent of a full crop compiled from the November issues of the monthly reports of the Federal Crop Estimating Service. See Crops and Markets and its predecessors. A brief discussion of the meaning of a "full crop" is given in footnote 15, page 23.

Full crops are computed by dividing the latest production estimates for any given year (table 30, page 101) by the per cent of a full crop and multiplying by 100.

*Comparison of Production and Shipments on Pacific Coast and in Other States.*—Curves showing carlot shipments have been included in figure 3 to show how closely the trend of pear production on the Pacific Coast has paralleled that of shipments.<sup>16</sup> There seems to be less of a tendency for shipments to move up and down with production in the rest of the United States than on the Pacific Coast. In nearly every one of the last nine years Pacific Coast pear shipments have risen or fallen somewhat in proportion to changes in production, and

<sup>16</sup> See table 32, page 103, for United States shipments of pears by chief sections, 1917-1927, and table 30, page 101, for United States pear production by chief states and groups, 1917-1927.

as a result the trends of the two have been nearly parallel.<sup>17</sup> This fairly consistent relationship between production and shipments is obviously helpful as a means of forecasting what pear shipments from this section are likely to be on the basis of production forecasts and, likewise, as a means of revising production estimates on the basis of reported carlot shipments.

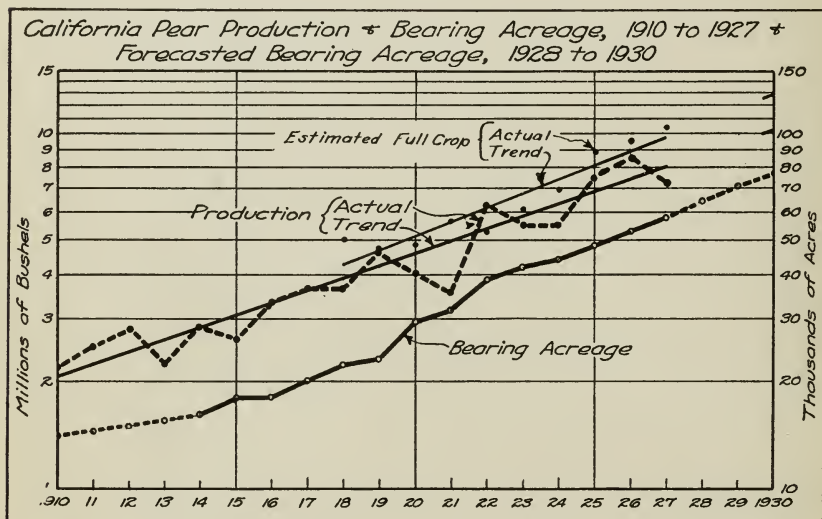


Fig. 4.—The average California pear crop increased from about 51,000 tons in 1910 to about 175,000 tons in 1926. An average crop in 1930 may be in the neighborhood of 250,000 tons.

(Data from table 5.)

*Trend of California Acreage and Production.*—The rapid rate of increase in the bearing acreage and production of pears in California since 1910 is pictured in figure 4. The bearing acreage of pears, which was somewhat over 14,000 acres in 1910, had risen to over 29,000 by 1920. In 1925 it totalled over 48,000 acres, and estimates of the California Cooperative Crop Reporting Service place it at 77,000 acres by 1930.

Production in the state in the last sixteen years has moved steadily upward at a rate of about 8 per cent a year, or at about the rate of

<sup>17</sup> In judging the trend of shipments as shown by the curves in figure 3, it must be remembered that the data on carlot shipments before 1920 are probably somewhat incomplete. Likewise, both production and shipments of pears in 1926 were abnormally large because of unusually favorable conditions for production throughout the country. The facts that data on shipments for 1918 and 1919 are incomplete and that those for 1926 are unusually large give the impression of a more rapid upward trend in shipments during this period than probably occurred.

increase recorded by the bearing acreage. Since 1918, however, production has increased more than 9 per cent a year. Whereas an average crop in 1910 was somewhat over 51,000 tons, in 1920 it was 109,000 tons and in 1926 about 175,000 tons.<sup>18</sup> Production and bearing acreage both doubled in the decade from 1910 to 1920, and in the five years from 1920 to 1925 production increased nearly 50 per cent and bearing acreage over 60 per cent.

TABLE 5

CALIFORNIA PRODUCTION AND BEARING ACREAGE OF PEARS, 1909-1927,  
AND FORECASTED BEARING ACREAGE, 1928-1930

| Year                   | Bearing acreage |                                   | Production                               |               |                             |
|------------------------|-----------------|-----------------------------------|------------------------------------------|---------------|-----------------------------|
|                        | Aeres           | Per cent of 1910 and 1914 average | Thousands of bushels (i.e., 000 omitted) | Tons          | Per cent of 1910-14 average |
| 1                      | 2               | 3                                 | 4                                        | 5             | 6                           |
| <i>1910-14 average</i> | <i>15,173</i>   | <i>100</i>                        | <i>2,524</i>                             | <i>63,060</i> | <i>100</i>                  |
| 1909                   |                 |                                   | 2,202                                    | 55,100        | 87                          |
| 1910                   | 14,100          | 93                                | 2,193                                    | 54,800        | 87                          |
| 1911                   |                 |                                   | 2,514                                    | 62,800        | 99                          |
| 1912                   |                 |                                   | 2,818                                    | 70,400        | 111                         |
| 1913                   |                 |                                   | 2,259                                    | 56,400        | 89                          |
| 1914                   | 16,246          | 107                               | 2,836                                    | 70,900        | 112                         |
| 1915                   | 18,029          | 119                               | 2,367                                    | 65,900        | 104                         |
| 1916                   | 18,039          | 119                               | 3,345                                    | 83,600        | 132                         |
| 1917                   | 20,228          | 133                               | 3,665                                    | 91,700        | 145                         |
| 1918                   | 22,416          | 148                               | 4,240                                    | 101,000       | 161                         |
| 1919                   | 23,056          | 152                               | 4,600                                    | 115,000       | 182                         |
| 1920                   | 29,366          | 193                               | 4,080                                    | 102,000       | 162                         |
| 1921                   | 31,718          | 209                               | 3,570                                    | 86,000        | 141                         |
| 1922                   | 38,591          | 254                               | 6,250                                    | 150,000       | 248                         |
| 1923                   | 41,831          | 276                               | 5,542                                    | 133,000       | 220                         |
| 1924                   | 44,315          | 292                               | 5,542                                    | 133,000       | 220                         |
| 1925                   | 48,277          | 318                               | 7,542                                    | 181,000       | 298                         |
| 1926                   | 53,608          | 354                               | 8,625                                    | 207,000       | 356                         |
| 1927                   | 58,138          | 384                               | 7,339                                    | 176,000       | 291                         |
| 1928                   | 65,200          | 430                               |                                          |               |                             |
| 1929                   | 71,700          | 473                               |                                          |               |                             |
| 1930                   | 77,400          | 510                               |                                          |               |                             |

Sources of data: Col. 2.—Data for 1910 from U. S. Census, see footnote to table 3, page 20; for 1914-1930 from Kaufman, E. E., California crop report for 1926. California Dept. Agr. Spec. Pub. 74: 25-26. 1927.

Col. 4.—From table 30, page 101.

Col. 5.—Data in col. 4 converted to tons at the rate of 40 bushels per ton, 1909-1917 and 41.7 for 1918-1926.

Figure 4 shows graphically that if the production of California were to continue to increase at the same annual rate from 1926 to

<sup>18</sup> These tonnages are approximately equivalent to 2 million bushels in 1910, to 4.5 in 1920, and to 7.3 in 1926.

1930 as it did from 1910 to 1926, an average pear crop by 1930 would be slightly over 10 million bushels (about 250,000 tons), or considerably more than double the production in 1920 and over 10 per cent greater than the abnormally large crop of 1926. On the other hand, if the increase in production of pears proceeds at the rapid rate indicated by the trend of bearing acreage and production in the last 10 years, one may accept an even larger average pear crop by 1930—one perhaps as large as 12 million bushels. Such a large crop, however, would be dependent upon a maintenance of the average yields per acre of the last decade.

*Factors Which May Change Future California Yields per Acre.—*

It seems difficult to forecast with any exactness the probable trend in the average yield per bearing acre of pear trees in the state in the next few years. Factors which may be tending to decrease this average yield are the apparent increase in the proportion of bearing trees which have not yet reached full-bearing age, and the possibility of an increasing proportional loss of trees due either to Japanese or other rootstock which may be poorly adapted to the section in which it has been used,<sup>19</sup> or to the effects of sour sap. Factors which may be tending to increase the average yield per acre of pears in the state are the increasing proportion of the bearing acreage grown in high-yielding sections which are well adapted to pear production,<sup>20</sup> and an increase in interplanting of cross-pollinating varieties,<sup>21</sup> and a decrease in losses from pear blight as the result of improved methods of prevention and control. Lack of adequate facts regarding these two groups of opposing forces and the difficulty of accurately measuring those that are available makes somewhat uncertain the answer to the question of what the probable net effect of these factors will be.

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<sup>19</sup> The Division of Pomology of the University of California has found considerable evidence that both Japanese and *ussuriensis* rootstocks cause the physiological disease known as "black-end" of pears. (For a discussion of "black-end" see Heppner, M. J., in the Proceedings of the American Society for Horticultural Science, 24, 1927 [in press].) It is estimated that about three-fourths of the pear trees planted in the state during the last decade have been on Japanese rootstock. (Based on data compiled by Mr. J. E. Bergholdt of nursery stock in dormant bud in California nurseries in June annually, 1917-1925.)

There is a serious question in the minds of some familiar with the pear industry of the state whether pears produced in some sections of the state on *Ussuriensis* rootstock may not, when they come into bearing, prove inferior in quality, as has already been the case in a number of instances.

<sup>20</sup> See figures 6, 7, and 8 and discussion on pages 31-34.

<sup>21</sup> The problems of pear pollination in California and the effect of cross-pollination upon maturity, shape, production, and keeping period are discussed in Tufts, W. P., and G. L. Philp. Pear pollination. California Agr. Exp. Sta. Bul. 373: 1-36. 1925.

*Influence of Pear Blight on the Industry.*—The ravages of pear blight are generally known to have been the chief obstacle to the extensive development of the pear industry in the east. On the Pacific Coast, the blight in recent years has proved to be more serious in the chief pear-producing sections of Oregon and Washington than in those of California.<sup>22</sup> However, a narrow belt along the Pacific Coast, including the coastal valleys of Washington and Oregon as well as of northern and central California, has remained remarkably free from the blight. It is significant that a large proportion of the young pear acreage in California is in these coastal districts.

Until about a decade ago the pear blight had proved so destructive in some sections of California that it was considered the most serious factor limiting the expansion of the industry in the state. About 1900 it practically wiped out the pear industry in the San Joaquin Valley and in the decade following 1903 the disease proved very destructive in the Sacramento Valley.

The commercial pear industry has been eliminated from the San Joaquin Valley where the disease was most virulent, and growers in the Sacramento Valley generally realize the serious necessity for constant vigilance against the disease. Methods of prevention and control have also been greatly improved. Largely as a result of these facts, relatively few pear trees have been lost in California from blight in recent years. In 1925 Swett states that "We do not know of any season in recent years, even the worst, when blight has ruined more than 70,000 trees or 700 acres."<sup>23</sup> Judging from his estimates, an average of not over one-half of one per cent of the pear acreage in the state has been destroyed in recent years. It seems reasonable to expect, therefore, that the inroads of pear blight may not prove more serious in the next few years than they have during the last decade.

#### CALIFORNIA PEAR-PRODUCING DISTRICTS

*Location of California Pear-Producing Districts.*—The location of the chief pear-producing sections of California can be seen by reference to the map in figure 5, showing the total of bearing and non-bearing pear acreage in California by counties in 1927. The industry

<sup>22</sup> Anonymous. Blight and the law. *California Pear Grower* 2 (11): 11. 1922. For a brief discussion of the history and the extent of pear blight in the United States, particularly on the Pacific Coast, see Reimer, F. C. Blight resistance in pears and characteristics of pear species in stocks. *Oregon Agr. Exp. Sta. Bul.* 214: 7. 1925.

<sup>23</sup> Swett, F. T. Annual report to the California Pear Growers' Association. *California Pear Grower* 5 (1): 8. 1925.

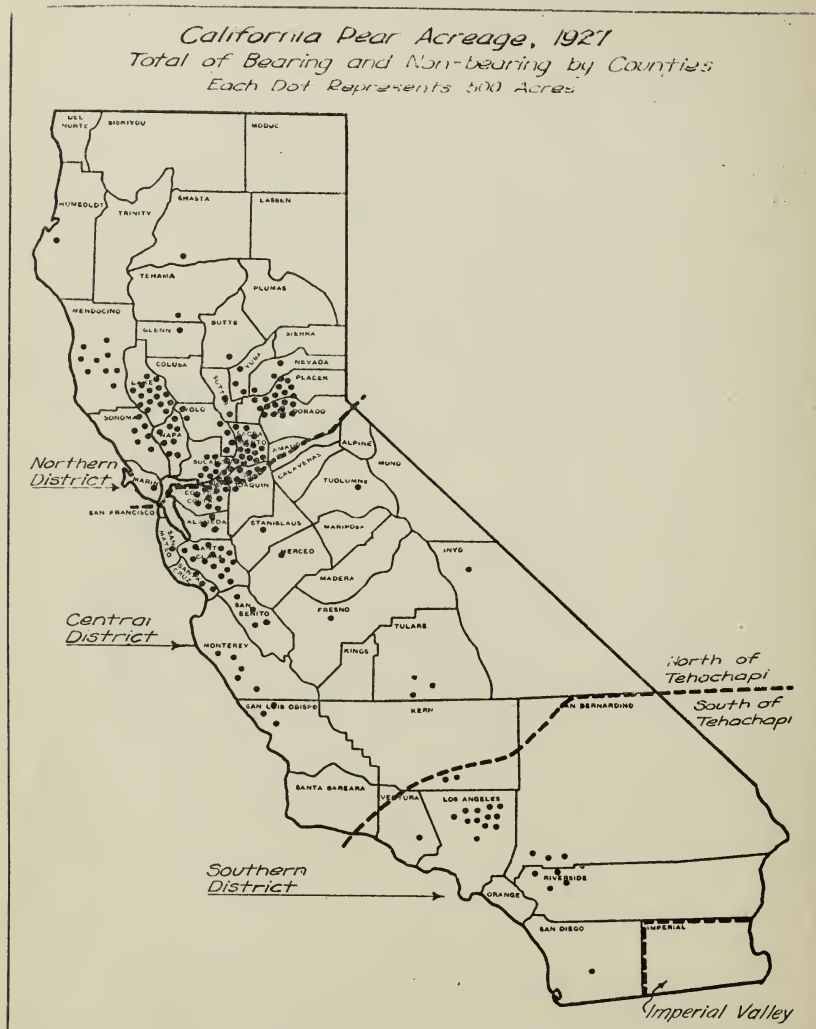


Fig. 5.—California pear acreage is largely concentrated in four important areas. It centers in (1) the Sacramento Valley district, merging into (2) the coast district, which stretches from Mendocino County on the north to San Luis Obispo on the south. (3) The mountain district of the Sierras embraces Placer, Eldorado, and Nevada counties chiefly, while (4) southern California includes the area south of the Tehachapi range.

(Note.—The dotted lines indicate the boundaries of the shipping districts used by the Market News Service of the United States Bureau of Agricultural Economics. The line separating the central and southern districts divides the state approximately into *north* and *south of Tehachapi* (a rugged mountain barrier separating the northern and southern part of the state except along the coast.) (Data from table 34, p. 105.)

may be said to center in the lower part of the **Sacramento Valley**, which section includes Sacramento, Solano, and Yolo counties chiefly, and most, if not all, of the pear acreage of San Joaquin and Contra Costa counties as well. Along the lower reaches of the Sacramento River the pear acreage is almost continuous for about 35 miles.<sup>24</sup> The Sacramento Valley pear district is second in pear acreage to the coast district. The **coast district**, geographically, is divided into two sections, the one north of the San Francisco Bay embracing Lake, Mendocino, Sonoma, and Napa counties primarily; the other, somewhat more important judged by its acreage, embracing Santa Clara, Alameda, San Benito, Santa Cruz, Monterey, and San Luis Obispo counties chiefly. **Southern California** is third in acreage among the pear-producing sections of the state. The bulk of the acreage in this section is in Antelope Valley in Los Angeles County. Most of the remainder is in Riverside and San Bernardino counties and in Kern County in the vicinity of Tehachapi. The **mountain district**, which contains almost as large a pear acreage as southern California, largely embraces Eldorado, Placer, and Nevada counties.

*Relative Importance of Chief Districts.*—Figure 6 shows the relative importance of the five chief pear-producing sections of the state on the basis of acreage, and figure 7 indicates the increase in bearing acreage which has taken place in each since 1921. The coast district, the largest, contains a total of 35,000 acres, over 20,000 of which, or practically 58 per cent, are in bearing. About 11,000 acres of these have come into bearing since 1921 (fig. 7). Nearly 15,000 acres, or about 42 per cent of the present acreage, are not yet in bearing. The large proportion of non-bearing trees in this district indicates the most rapid rate of increase in bearing acreage and production in the next decade of any section in the state. In actual tonnage this increase should likewise be very large, since about 35 per cent of the total pear acreage of the state is in this district and over 48 per cent of the non-bearing acreage. In addition, the excellent adaptability of much of this area to pear production and the freedom from serious attacks of blight makes the yields per acre normally heavier than the average for the state.

Reference to table 34 shows that the largest part of the non-bearing acreage of pears in the coast district is north of San Francisco Bay, chiefly in the three counties of Lake, Mendocino, and Napa. Nearly 10,000 acres, or about 54 per cent, of the pear trees in this section north of the Bay were still not in bearing in 1927. On the other hand,

<sup>24</sup> Tufts, W. P. Growing Bartlett's in California. Oregon Grower 4:219. 1923.

of nearly 17,000 acres in the coast district south of the Bay in 1927, only about 30 per cent were still non-bearing. Santa Clara County, which ranks third in pear acreage in the state and second to Lake County in the Coast district, has an acreage of nearly 7,100, only 25 per cent of which is non-bearing. In striking contrast to the relatively small proportional increase which can be expected from the coast counties south of the Bay is the large expansion in bearing acreage and production which will occur north of the Bay. About 48 per cent of the 7,700 acres of pears in Lake County, about 62 per cent of the 4,200 acres in Mendocino County, and over 60 per cent of the 3,800 acres in Napa County, were not of bearing age in 1927.

Both Bartletts and late varieties of pears are grown in the coast district, Bartletts being most important north of the Bay and in Contra Costa and Santa Clara counties. Bartletts from south of the Bay are used chiefly for canning purposes.<sup>25</sup> The acreage of fall and winter varieties of pears in the Coast district south of the Bay is the most extensive in the state.

**Sacramento Valley** ranks second in acreage and production among the pear-growing districts of California and generally produces high yields per acre. About 28,500 acres, or approximately 32 per cent of the pear acreage of the state in 1927, were in this district. Of these, nearly 20,000 acres or 71 per cent, were in bearing and over 8,000, or 29 per cent, were not in bearing. The bearing acreage increased by 7,000 acres since 1921. The pear industry has been developed for a longer period in the Sacramento Valley than in the coast district, and hence a larger proportion of the good pear lands have been planted to pears, and a relatively smaller acreage is available for the expansion of the industry. The pears produced in the Sacramento Valley are shipped to eastern markets in large quantities, and a large tonnage is canned.

Figure 8 shows that Sacramento County, containing 10,000 acres of pears, leads the state in both total and bearing acreage. The total acreage is so much greater than that in any other county and the average yield per acre so large, that it seems likely that Sacramento will continue to be the largest-producing county in the state for a good many years to come, in spite of the fact that the non-bearing acreage is such a small proportion (30 per cent) of the total. Solano, second in acreage among the counties included in the Sacramento Valley, ranks eighth among all the counties in the state. It contains slightly over 4,000 acres of pears, less than 15 per cent of which are not of bearing age.

<sup>25</sup> Tufts, W. P. Growing Bartletts in California. Oregon Grower 4:219. 1923.

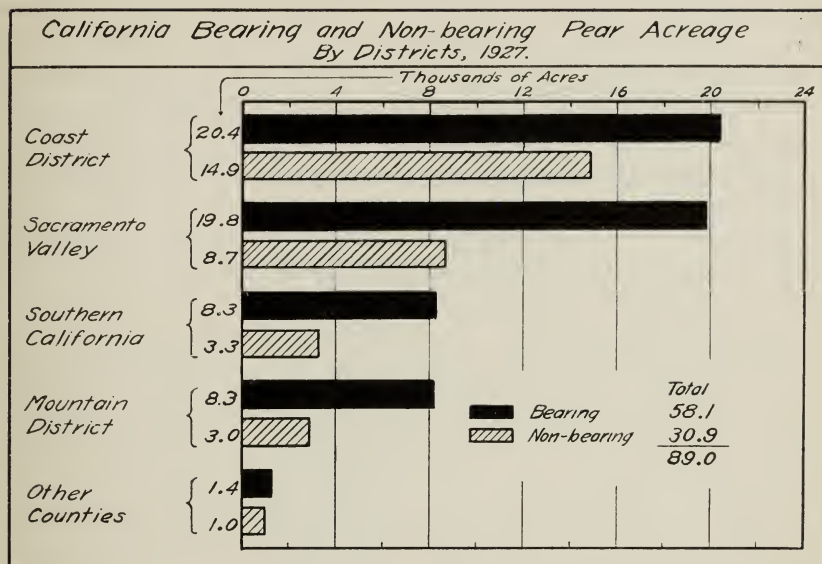


Fig. 6.—The coast district and the Sacramento Valley together contain nearly 70 per cent of the bearing pear acreage in California and about 75 per cent of the non-bearing acreage. The most rapid increase in production is occurring in the coast section north of San Francisco Bay, in which over 65 per cent of the pear acreage was not yet in bearing in 1927.

(Data from table 34, page 105.)

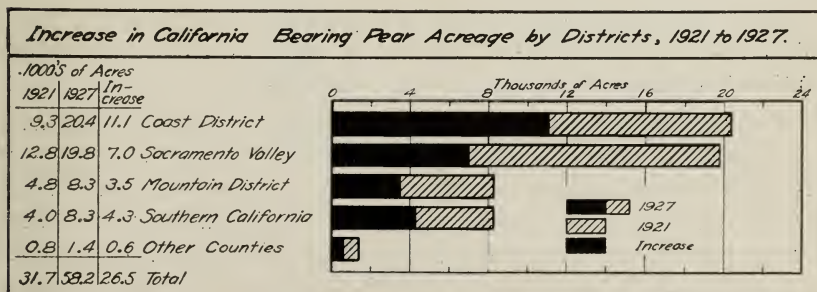


Fig. 7.—From 1921 to 1927 the bearing acreage of pears in California increased almost 85 per cent. The largest increase occurred in the coast district, in which the bearing acreage more than doubled. There has also been a large increase in the Sacramento Valley.

(Data from table 34, page 105.)

The pear acreage of southern California, which holds third place among the pear-producing sections of the state, amounted to 11,600 acres in 1927, or nearly 13 per cent of the state total. Of this, 3,300 acres, or 29 per cent, were still too young to bear. The bearing acreage increased approximately 4,300 acres since 1921. The greater part of the pear acreage of this district is in Los Angeles County, which ranks fourth among the counties of the state. Of a total of 5,900 acres in this county, one-fourth is still to come in bearing. Pears in the southern part of the state are produced primarily for the fresh-fruit market, a large proportion being consumed in the larger population centers of southern California itself.

The three counties Placer, Eldorado, and Nevada contain most of the pear acreage of the **mountain district** of California, which is fourth among the pear-producing sections of the state. Approximately 11,300 acres, or 13 per cent of the acreage of the state, were embraced by this district in 1927. Of this acreage about 26 per cent is not yet in bearing. The bearing acreage increased about 3,500 acres since 1921. Most of the non-bearing acreage in this section is in Placer and Eldorado counties.

The yield per acre of pears in this section is below the average for the state. The eating quality of the pears, however, is generally conceded to be excellent. As a result practically all are shipped to eastern markets. A considerable acreage of fall and winter varieties of pears has been planted in this district in recent years, partly because these varieties have usually brought a better price<sup>26</sup> than the earlier Bartletts, and also because several of them are relatively more resistant to blight than the Bartletts. In addition, a number of the better varieties of late pears have been shown to improve the yield of Bartletts appreciably when used as cross-pollinizers.<sup>27</sup>

The four important pear-growing sections of the state which have been discussed contain over 97 per cent of the total pear acreage of the state, leaving less than 3 per cent of the acreage in the San Joaquin Valley. At one time several counties in the **San Joaquin Valley** proper, particularly Kings and Fresno counties, were large producers of pears. About twenty-five years ago, however, the industry in this part of the state was almost completely wiped out by the blight, and production on a commercial scale has never been resumed in most of this area.

<sup>26</sup> See discussion, pages 40-42.

<sup>27</sup> Tufts, W. P., and G. L. Philp. Pear pollination. California Agr. Exp. Sta. Bul. 373: 1-36. 1925.

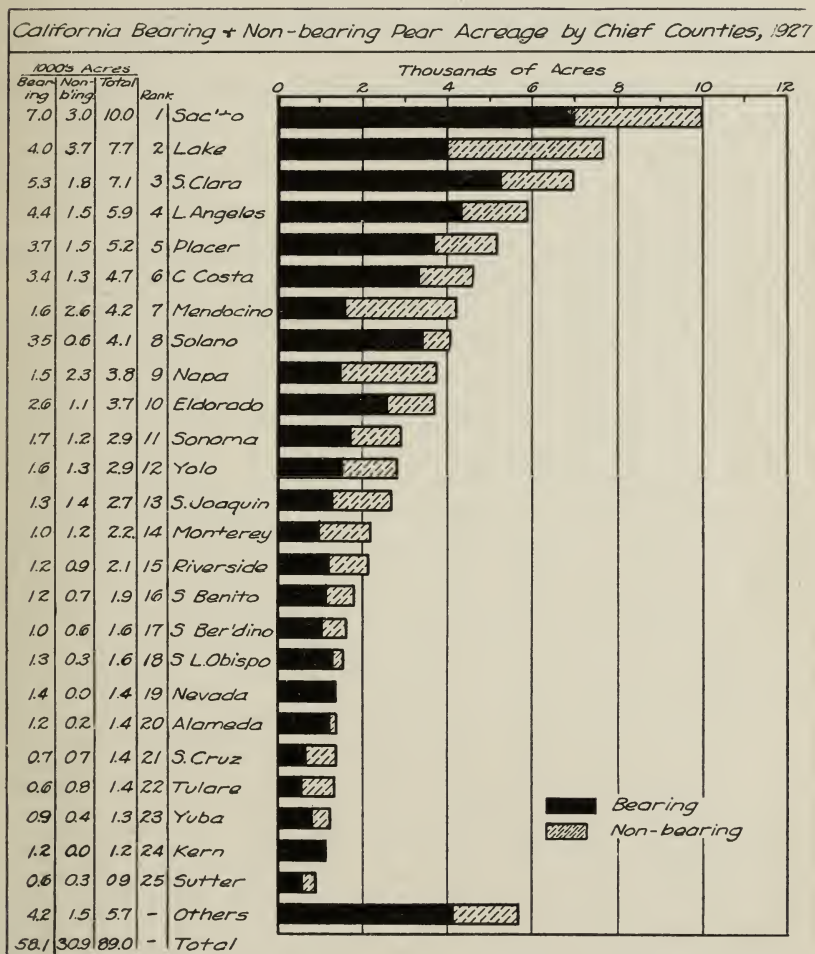


Fig. 8.—Half of the counties in California contain over 95 per cent of the pear acreage, and the first ten about 63 per cent.

(Data from table 34, page 105.)

## PRICES AND PURCHASING POWER OF FRESH PEARS

*Purchasing Power of California Bartletts, 1909-1927.*<sup>28</sup>—Although the prices and purchasing power of California shipments of fresh Bartlett pears as shown in figure 9 and table 6 are estimated f.o.b. figures, they may fairly be used to picture the trend of average returns to California growers in the last seventeen years. The curve of purchasing power shows no apparent tendency either to rise or to fall since 1909. Comparison of the curve of purchasing power with the general upward trend of pear prices from 1915 to 1920 indicates that on the average the eastern price of California pears was rising no faster than the general level of the prices of all commodities.

The relatively great increase in the per-capita consumption of fresh pears in eastern centers of population in recent years has apparently been accompanied by a sufficient stimulation of demand to offset the normal tendency for purchasing power to fall as supplies of pears and competing fresh fruits increased. It seems probable, however, that the rapid increase in commercial production of pears which is taking place in the United States, particularly on the Pacific Coast, will result in declining purchasing power for average crops during the next few years. This tendency to decline is indicated by the curve showing the purchasing power of California canning Bartletts (fig. 27, p. 89). The annual purchasing power per ton of California's crop from 1918 to date, based on the California Crop

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<sup>28</sup> *Meaning of Purchasing Power.*—The fluctuations in prices shown in the upper line in figure 9 represent price changes that have been due to two sets of causes: one, the changing value of the dollar; the other, changes in the relations of the supply of, and the demand for, California fresh Bartletts in eastern markets. It has not been possible in any year since 1914 for Americans to purchase as many units of goods in general for a dollar as they could during the period from 1910 to 1914. The supply of money and credit from 1914 to 1920 increased faster than the trade demands for it and, chiefly as a result of this fact, the value of money, or its purchasing power, fell. As a result of this decline in the value of money, at least two dollars were necessary in 1918, 1919, and 1920 to buy goods in general which could have been bought for one dollar in 1914. This being the case, the dollars which pear growers received in these years were worth in general purchasing power less than half as much as those which they received and spent before 1914.

In order to approximate the f.o.b. price per ton for eastern Bartlett sales in terms of general purchasing power, changes in the value of the dollar have been eliminated by the method generally used by economists and statisticians. The upper solid line in figure 9 shows the actual prices received. The lower line shows these same prices after they have been converted to purchasing power, that is, deflated, or expressed in terms of dollars of the average value or purchasing power during the period 1910-1914. The fluctuations pictured in this curve of purchasing power per ton represent, therefore, price changes resulting primarily from changes in the supply of, or the demand for, California fresh Bartletts in eastern markets; or from coincident changes in both.

Reporting Service estimates of the average farm prices, also shows a slight downward movement (fig. 10, and table 7).<sup>29</sup>

With increasing production tending to lower prices, it behooves growers who produce an excellent quality of pears to make sure that in the future they secure the premium over poorer quality pears that their fruit deserves. The importance of this matter is emphasized by the large proportion of the trees coming into bearing which are on Ussuriensis and Japanese root stocks, which trees are said to produce pears inferior in quality compared with those produced on French stock.<sup>30</sup>

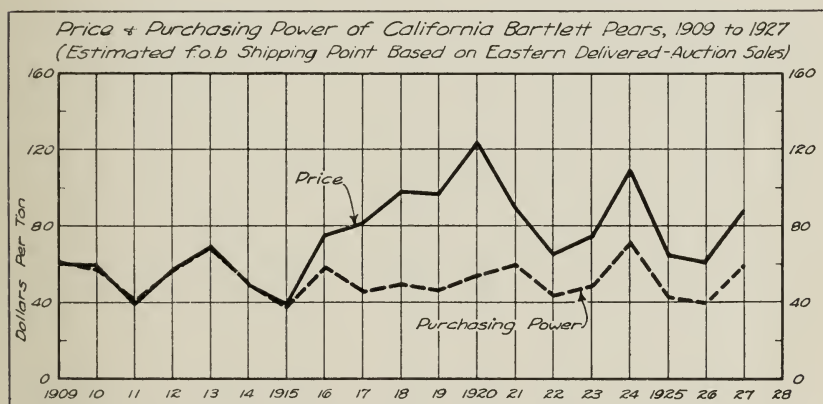


Fig. 9.—Although there has been no apparent tendency for the trend of purchasing power per ton of California Bartletts in eastern markets either to rise or to fall in the last fifteen years, it seems probable that it will decline appreciably with increasing production in the next few years.

(Data from table 6.)

Since 1919 there has been a tendency for the purchasing power per ton of California Bartlett pears to fall in years when interstate shipments from north of Tehachapi increased and to rise when such shipments declined. The bulk of California Bartletts are shipped in July and August. Probably because of this fact there seems to be a slightly closer inverse relation between the purchasing power of California Bartlett pears and interstate pear shipments for the two months of July and August than between purchasing power and interstate shipments for the whole season. When July and August ship-

<sup>29</sup> The prices and purchasing power of pears are discussed elsewhere in this bulletin as follows: monthly export prices of fresh pears, page 62; relation of weekly supply to price, page 75; canning-pear prices and purchasing power, page 89; and dried-pear prices and purchasing power, page 99.

<sup>30</sup> See footnote 19, page 28.

TABLE 6

PRICE AND PURCHASING POWER OF CALIFORNIA BARTLETT PEARS, 1909-1927  
(EASTERN DELIVERED-AUCTION AND ESTIMATED F.O.B. SHIPPING POINT)

| Year                         | Gross<br>auct ion<br>price<br>per<br>box | Estimated f. o. b. shipping points |                |                                   |                  |                                   | All-com-<br>modity<br>wholesale<br>price<br>index | Freight and refrigeration<br>charges per box |                    |               |
|------------------------------|------------------------------------------|------------------------------------|----------------|-----------------------------------|------------------|-----------------------------------|---------------------------------------------------|----------------------------------------------|--------------------|---------------|
|                              |                                          | Price                              |                |                                   | Purchasing power |                                   |                                                   | Freight                                      | Refriger-<br>ation | Total         |
|                              |                                          | Per<br>box                         | Per<br>net ton | Per cent<br>of 1910-14<br>average | Per<br>net ton   | Per cent<br>of 1910-14<br>average |                                                   |                                              |                    |               |
| 1                            | 2                                        | 3                                  | 4              | 5                                 | 6                | 7                                 | 8                                                 | 9                                            | 10                 | 11            |
| <i>Average<br/>1910-1914</i> | <i>\$2.17</i>                            | <i>\$1.25</i>                      | <i>\$54.50</i> | <i>100</i>                        | <i>\$54.50</i>   | <i>100</i>                        | <i>100</i>                                        | <i>\$0.60</i>                                | <i>\$0.17</i>      | <i>\$0.77</i> |
| 1909                         | 2.45                                     | 1.38                               | 60.00          | 110                               | 60.60            | 112                               | 99                                                | 0.73                                         | 0.17               | 0.90          |
| 1910                         | 2.40                                     | 1.36                               | 59.20          | 109                               | 57.50            | 106                               | 103                                               | 0.70                                         | 0.17               | 0.87          |
| 1911                         | 1.75                                     | .90                                | 39.20          | 72                                | 41.30            | 76                                | 95                                                | 0.57                                         | 0.16               | 0.73          |
| 1912                         | 2.20                                     | 1.30                               | 56.60          | 104                               | 56.00            | 103                               | 101                                               | 0.57                                         | 0.17               | 0.74          |
| 1913                         | 2.50                                     | 1.58                               | 68.70          | 126                               | 67.40            | 125                               | 102                                               | 0.57                                         | 0.17               | 0.74          |
| 1914                         | 2.00                                     | 1.12                               | 48.70          | 90                                | 48.70            | 90                                | 100                                               | 0.57                                         | 0.17               | 0.74          |
| 1915                         | 1.75                                     | .88                                | 38.30          | 70                                | 37.20            | 69                                | 103                                               | 0.57                                         | 0.17               | 0.74          |
| 1916                         | 2.65                                     | 1.72                               | 74.80          | 138                               | 58.00            | 107                               | 129                                               | 0.57                                         | 0.17               | 0.74          |
| 1917                         | 2.80                                     | 1.86                               | 80.90          | 149                               | 45.00            | 83                                | 180                                               | 0.57                                         | 0.17               | 0.74          |
| 1918                         | 3.40                                     | 2.25                               | 97.90          | 180                               | 49.40            | 91                                | 198                                               | 0.74                                         | 0.17               | 0.91          |
| 1919                         | 3.85                                     | 2.22                               | 96.60          | 178                               | 46.00            | 85                                | 210                                               | 0.74                                         | 0.17               | 0.91          |
| 1920                         | 4.35                                     | 2.85                               | 124.00         | 228                               | 53.90            | 100                               | 230                                               | 0.99                                         | 0.21               | 1.20          |
| 1921                         | 3.50                                     | 2.06                               | 89.60          | 165                               | 59.70            | 110                               | 150                                               | 0.99                                         | 0.21               | 1.20          |
| 1922                         | 2.75                                     | 1.49                               | 64.80          | 119                               | 42.60            | 79                                | 152                                               | 0.87                                         | 0.20               | 1.07          |
| 1923                         | 3.00                                     | 1.72                               | 74.80          | 138                               | 48.00            | 89                                | 156                                               | 0.87                                         | 0.20               | 1.07          |
| 1924                         | 3.85                                     | 2.51                               | 109.20         | 201                               | 71.80            | 133                               | 152                                               | 0.87                                         | 0.20               | 1.07          |
| 1925                         | 2.75                                     | 1.49                               | 64.80          | 119                               | 40.00            | 74                                | 152                                               | 0.87                                         | 0.20               | 1.07          |
| 1926                         | 2.65                                     | 1.40                               | 60.90          | 112                               | 39.50            | 73                                | 154                                               | 0.87                                         | 0.20               | 1.07          |
| 1927                         | 3.32                                     | 2.02                               | 87.90          | 161                               | 59.00            | 109                               | 149                                               | 0.87                                         | 0.20               | 1.07          |
| 1928                         |                                          |                                    |                |                                   |                  |                                   |                                                   |                                              |                    |               |

Source of data:

Col. 2.—Years 1909-1912, and 1914-1916 are weighted averages for July and August computed from daily range of sales prices of Bartletts on New York City delivered-auction market as quoted in California Fruit News. The simple averages of daily ranges were averaged by weeks and weekly averages weighted by interstate shipments of pears from North of Tehachapi for the week ending two weeks prior to that of the sales. Year 1913 is weighted average price for Bartletts from the Sacramento River district only. Years 1917 and 1918 are weighted averages of New York delivered-auction prices during the bulk of each season. Years 1919-1926 are weighted-average prices of California Bartletts on the chief eastern delivered-auction markets.

Col. 3.—Computed by subtracting the total of freight and refrigeration in col. 11 and a sales commission of 7 per cent from the gross auction price in col. 2.

Col. 4.—Computed by multiplying the price per box in col. 3 by 43.5 (the approximate number of packed boxes of a net weight of 46 lbs. in a ton).

Col. 6.—Items in col. 4 divided by items for corresponding year as given in col. 8 and multiplied by 100.

Col. 8.—U. S. Bureau of Labor Statistics all-commodity wholesale-price index for the United States for calendar years converted to a 1910-1914 base of 100. Data from U. S. Dept. Agr. Bur. Agr. Econ. Agricultural Situation 12 (4):6. April, 1928.

Col. 9.—Freight rate by rail to nearest whole cent per box of an estimated weight of 50 lbs. gross, based on the rate per 100 lbs. from California to New York City as compiled from freight tariffs. The rates for the years 1918-1921 inclusive includes the 3-per-cent war tax.

Col. 10.—Refrigeration rate by rail in nearest whole cent per box of an estimated weight of 50 lbs. gross, based on the rate per car from California to New York City as compiled from refrigeration tariffs. Prior to 1912 there were different refrigeration rates for different sections of California. The rates used in this table for these years are, however, believed to be representative of the chief pear-shipping districts at the time. The rates for the years 1918-1921 inclusive include the 3-per-cent war tax.

ments of Oregon and Washington pears, together with those of California, are taken into consideration this same tendency to inverse relationship between shipments and the purchasing power per ton of California Bartlett pears is evident. However, as will be seen from the discussion on the relation of seasonal variations in supply to prices, the closest relation between purchasing power and market supplies is found when weekly data are analyzed.<sup>31</sup>

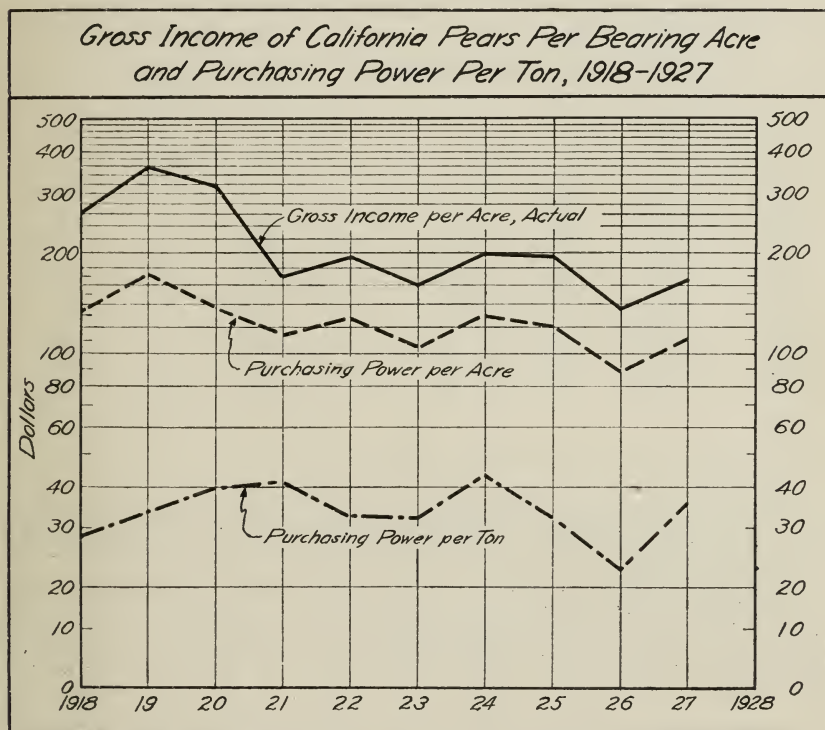


Fig. 10.—The farm purchasing power per ton of California pears has declined but slightly in the last decade, while the gross income per bearing acre has declined appreciably, chiefly because of low yields per acre resulting largely from the increase in the proportion of young bearing trees.

(Data from table 7.)

*Gross Income per Acre.*—Gross returns per bearing acre of pears are shown in figure 10 to have declined in California since 1918. This decline is partly because the farm value per ton has declined slightly, but more largely because the yield of pears per bearing acre has not been so great since 1920 as previously. This apparent reduction in average yield per bearing acre in recent years is probably chiefly the result of a decrease in the proportion of the bearing

<sup>31</sup> See discussion, pages 75-81.

trees of maximum bearing age, due to the relatively large increase in young bearing trees.

TABLE 7

FARM PRICE AND PURCHASING POWER OF CALIFORNIA PEARS PER TON AND PER BEARING ACRE, 1918-1927

| Year  | Price<br>per ton,<br>dollars | Purchasing power<br>per ton |                     | Gross income<br>per bearing acre |                  |                     | All-commodity<br>wholesale<br>price index |
|-------|------------------------------|-----------------------------|---------------------|----------------------------------|------------------|---------------------|-------------------------------------------|
|       |                              | Dollars                     | Per cent<br>of 1919 | Price,<br>dollars                | Purchasing power |                     |                                           |
|       |                              |                             |                     |                                  | Dollars          | Per cent<br>of 1919 |                                           |
|       | 1                            | 2                           | 3                   | 4                                | 5                | 6                   | 7                                         |
| 1918  | 56.00                        | 28.30                       | 83                  | 264                              | 133              | 78                  | 198                                       |
| 1919  | 72.00                        | 34.30                       | 100                 | 360                              | 171              | 100                 | 210                                       |
| 1920  | 90.00                        | 39.10                       | 114                 | 313                              | 136              | 79                  | 230                                       |
| 1921  | 62.50                        | 41.30                       | 121                 | 169                              | 113              | 66                  | 150                                       |
| 1922  | 50.00                        | 32.90                       | 96                  | 194                              | 128              | 75                  | 152                                       |
| 1923  | 50.00                        | 32.00                       | 94                  | 159                              | 102              | 60                  | 156                                       |
| 1924  | 66.00                        | 43.40                       | 127                 | 198                              | 130              | 76                  | 152                                       |
| 1925  | 52.00                        | 32.10                       | 94                  | 195                              | 120              | 70                  | 162                                       |
| 1926  | 35.00                        | 22.70                       | 66                  | 135                              | 88               | 51                  | 154                                       |
| 1927* | 54.00                        | 36.20                       | 105                 | 164                              | 110              | 64                  | 149                                       |
| 1928  |                              |                             |                     |                                  |                  |                     |                                           |

\* Data for 1927 are preliminary and subject to revision.

Sources of data:

Col. 1.—Farm value per ton of California pear crop as estimated by the California Crop Reporting Service. Year 1918 from California Fruit News, Dec. 27, 1919, p. 16-B; years 1919-1925 from California Crop Report for 1925. California Dept. Agr. Spec. Pub. 63: 26, 1926; years 1926 and 1927 from California Cooperative Crop Reporting Service. Summary of California Annual Crop Report, 1927 p. 3. (mimeo.). Jan. 4, 1928.

Cols. 2 and 5.—Items in cols. 1 and 4 respectively, divided by wholesale price index in col. 7 for corresponding year and multiplied by 100.

Col. 4.—Estimated gross farm income from the California pear crop divided by estimated bearing acreage. Farm price from col. 1, production and acreage from table 5, page 27.

Col. 7.—U. S. Bureau of Labor Statistics all-commodity wholesale-price index for the United States for calendar years, converted to a 1910-1914 base of 100. Data from U. S. Bur. Agr. Econ., Agricultural Situation 12 (4): 6. April, 1928.

*Comparison of Prices of Bartletts and Late Varieties.*—The New York delivered-auction prices<sup>32</sup> of all the varieties of Pacific Coast pears pictured in figure 11 have tended to move up or down together rather consistently during the last ten years. Both Oregon and California Bartlett pears, however, have, on the average, sold at a lower

<sup>32</sup> The annual average prices of late varieties of pears originating in Oregon are used in this discussion because no such series for these varieties of California pears were readily available. Likewise these averages are believed to be approximately representative of what California pears of the same variety and quality sold for, or would have sold for, on the New York auctions, since the marketing season for late varieties of California pears is usually but slightly earlier than that of the same varieties originating in Oregon. Figure 2, page 17, shows the relative volume of weekly sales of each of these late varieties from Oregon and from California individually on the New York delivered-auction market in 1926. Table 1, page 15, shows that these averages are based upon sales of several thousand boxes of each variety.

(Footnote continued at bottom of opposite page.)

prices than the composite average price of the four late varieties shown in figure 11. Reference to the lower right-hand corner of the figure shows that the Bosc-Anjou composite average has been noticeably higher than that of Bartletts in every one of the last ten years. Winter Nelis is the only one of the four late varieties included in the lower left hand corner of figure 11 the purchasing power of which has averaged less than that of California Bartletts on the New York delivered-auction market during the last ten years.

A study of the lower left-hand portion of the figure shows that the low price of Winter Nelis pears has largely been responsible for holding down the composite average of Comice and Winter Nelis prices to about that of Bartletts. Winter Nelis have been lower in price than Comice in all but three of the last ten years, and have averaged about 20 cents per box less than California Bartletts during this whole period. Comice have in almost every year been slightly higher in price than Bartletts, averaging not quite 10 cents a box more than California Bartletts. Both Bosc and Anjou, however, have been noticeably higher in price than Comice, Bartletts, or Winter Nelis until the last two years. In the eight years, 1917-1924, Anjous averaged over 50 cents a box more than California Bartletts and Bosc nearly \$1.50 more.

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(Footnote continued from preceding page.)

In using these prices, particularly in comparing prices of the different varieties, it should be remembered that the difference in the New York auction price and the farm price received by the grower after deducting all packing, marketing, and distribution costs, differs considerably for the different varieties of pears. All of the late varieties which are held in storage before being sold have to pay a storage charge plus the additional cost of hauling and handling involved in putting the pears into and taking them out of storage. Most Bartletts are not held in cold storage before being sold and hence are not subject to these charges. Fig. 21, p. 73, and table 36, p. 107, show that the length of time that the bulk of different late varieties of pears are held in storage varies greatly. The storage charges on the different varieties therefore may vary greatly. Carloads of winter pears for the New York market are usually stored in cold-storage houses on the Jersey City side. The storage rates charged by the four chief warehouses vary as follows: one charges 10 cents a box for the first month and 7 cents for each month or fraction of a month thereafter, another 10 and 6 cents, respectively, and two charge 9 and 6 cents, respectively. Pears stored in Jersey City are loaded into cars and brought over to the auction piers in New York City on Manhattan Island on lighters. A switching charge of \$6.30 a car (of about 520 boxes) is the only additional cost for this movement.

In the case of pears stored in transit en route to New York City at points other than Jersey City, the storage rates are comparable to those given for Jersey City warehouses, but in addition to the regular through freight rate, the railroad charges 6½ cents a hundred for handling in and out of storage, and instead of charging the through rate on refrigeration the rate *in* and *out* is charged in addition. For instance, if a car of pears were stored in Kansas City and subsequently sold in New York, the rate would be \$1.60 a hundred to New York, plus 6½ cents, plus the carload refrigeration rate from California to Kansas City (\$85), plus the carload refrigeration rate from Kansas City to New York. The refrigeration charges on a typical car stored in Kansas City would be \$85 from California to Kansas City, and \$70 more from Kansas City to New York, or a total refrigeration charge of \$155, as against \$105 on a through car.

In the last two years, however, there seems to have been some decrease in the large premium that Bosc and Anjou have commanded over Bartletts. It does not seem wise to attempt to judge from the data pictured in figure 11 alone, whether there is a decisive tendency for the price of Bosc and Anjou to fall more nearly to the level of Bartlett prices than they have in the past. Evidence of increasing acreage and production of these varieties on the Pacific Coast would lead one to expect that the tendency of the price of Bosc and Anjou might be downward, unless demand is stimulated in proportion to the increase in output. No such stimulation of demand, however, at the present time seems to be occurring.

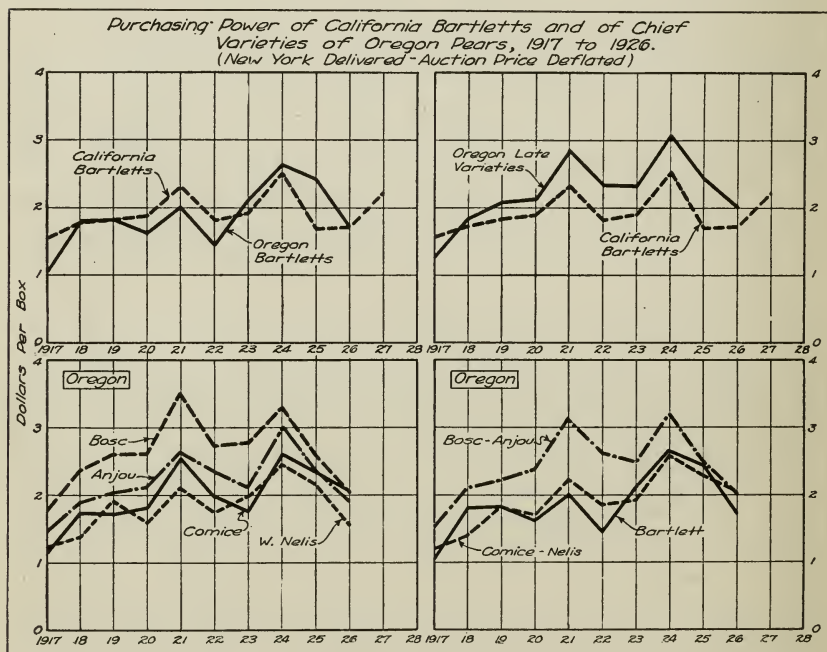


Fig. 11.—The prices of the better late varieties of Pacific Coast pears have averaged considerably higher than those of Bartletts in the last ten years. The large differential in their favor, however, will probably be reduced as their production increases in the next few years.

(Data from table 35, page 106.)

*How to Estimate Ranch Price from Eastern Auction Price.*—During that part of the pear-shipping season in which many growers have to choose between the alternatives of shipping their Bartlett pears to eastern markets and of selling them to the cannery, it is advisable to compare the price per ton offered by canners with the probable returns from the same pears if sold in the eastern delivered-auction markets.

TABLE 8

ESTIMATED EQUIVALENT AT CALIFORNIA RANCHES OF DELIVERED-AUCTION PRICES  
OF UNSTORED BARTLETT'S IN NEW YORK, PHILADELPHIA,  
BALTIMORE, CLEVELAND, AND PITTSBURG\*

| Delivered-auction price per box | Equivalent California price |         | Total charges per box | Delivered-auction price per box | Equivalent California price |         | Total charges per box | Delivered-auction price per box | Equivalent California price |         | Total charges per box |
|---------------------------------|-----------------------------|---------|-----------------------|---------------------------------|-----------------------------|---------|-----------------------|---------------------------------|-----------------------------|---------|-----------------------|
|                                 | Per box                     | Per ton |                       |                                 | Per box                     | Per ton |                       |                                 | Per box                     | Per ton |                       |
| 1                               | 2                           | 3       | 4                     | 1                               | 2                           | 3       | 4                     | 1                               | 2                           | 3       | 4                     |
| \$1.50                          | —\$0.19                     | —\$9    | \$1.69                | \$2.40                          | \$0.64                      | \$28    | \$1.76                | \$3.30                          | \$1.48                      | \$64    | \$1.82                |
| 1.60                            | — 0.10                      | — 4     | 1.70                  | 2.50                            | 0.73                        | 31      | 1.77                  | 3.40                            | 1.57                        | 68      | 1.83                  |
| 1.70                            | — 0.01                      | — 0.4   | 1.71                  | 2.60                            | 0.83                        | 36      | 1.77                  | 3.50                            | 1.66                        | 71      | 1.84                  |
| 1.80                            | 0.08                        | 3       | 1.72                  | 2.70                            | 0.92                        | 40      | 1.78                  | 3.60                            | 1.76                        | 76      | 1.84                  |
| 1.90                            | 0.18                        | 8       | 1.72                  | 2.80                            | 1.01                        | 44      | 1.79                  | 3.70                            | 1.85                        | 79      | 1.85                  |
| 2.00                            | 0.27                        | 12      | 1.73                  | 2.90                            | 1.11                        | 48      | 1.79                  | 3.80                            | 1.94                        | 83      | 1.86                  |
| 2.10                            | 0.36                        | 15      | 1.74                  | 3.00                            | 1.20                        | 52      | 1.80                  | 3.90                            | 2.04                        | 88      | 1.86                  |
| 2.20                            | 0.46                        | 20      | 1.74                  | 3.10                            | 1.29                        | 55      | 1.81                  | 4.00                            | 2.13                        | 92      | 1.87                  |
| 2.30                            | 0.55                        | 24      | 1.75                  | 3.20                            | 1.39                        | 60      | 1.81                  | 4.10                            | 2.22                        | 95      | 1.88                  |

\* It costs approximately one cent more per box to ship to Boston and to Quebec than to the markets listed above and approximately three cents less to Chicago and St. Louis.

Sources of data:

This table is an adaptation of a similar one presented in Hansen, C. J., and O. W. Holmes. Marketing California pears, 1926. U. S. Bur. Agr. Econ. circular (mimeo.) pp. 25-27. June, 1927.

Col. 2.—Delivered-auction price in col. 1 minus the total charge in col. 4.

Col. 3.—Price per box in col. 2 multiplied by 43, the approximate number of packed boxes to a net ton of pears.

Col. 4.—Total to the nearest whole cent of the following estimated approximate average costs: package and packing at the ranch 50 cents, cartage to station 8 cents, freight and refrigeration to New York, Philadelphia, Cleveland, Baltimore, and Pittsburg, \$1.002, and a sales commission of 7 per cent of the gross delivered-auction price. Freight and refrigeration charges to certain important markets not accounted for in this table are as follows: to Chicago and St. Louis \$0.973, and to Boston and Quebec \$1.015 per box. Approximate average costs of the items entering into the costs from packing at the ranch until loaded on the cars are given below. The figures do not include picking or cost of production.

|                                                         |       |                          |    |
|---------------------------------------------------------|-------|--------------------------|----|
| Box shook, delivered at depot.....                      | 15½c  | Nails.....               | 1c |
| Hauling shook, 4 miles.....                             | ½c    | Labels and labeling..... | 1c |
| Breakage of shook.....                                  | 1/10c | Paper.....               | 6c |
| Labor—packing, sorting, nailing boxes, and lidding..... | 12½c  | Pads (optional).....     | 2c |
| Rental of packing house.....                            | 4 c   | Hauling to depot.....    | 3c |
| Superintendence and overhead.....                       | 4½c   | Wiping by hand.....      | 7c |
| Loading on car by fruit company.....                    | 5 c   | Precooling.....          | 7c |

Table 8 is designed to aid in converting eastern auction prices into equivalent California farm prices when all the major costs involved in marketing Bartlett pears by this method are taken into consideration. The charges which have been deducted from the eastern price to cover all the various costs of packing, transportation, and marketing are, of course, estimated average figures. Aside from selling commission, freight, refrigeration, and cost of box shook, it is obvious that many of the items of cost included in the estimate of total charges will vary greatly, depending upon the particular situation, efficiency, etc., of individual growers and shippers. Hence those using this table as a basis for comparing prices offered at the ranch with actual or

with probable eastern delivered-auction prices, should substitute figures more representative of their own individual costs if good estimates or specific data are available to them.<sup>33</sup>

### EXPORTS OF FRESH PEARS

*Proportion of United States Crop Exported.*—The proportion of the United States pear crop exported in a fresh form has varied from about 3.5 to 7 per cent in the last five years, averaging slightly over 5 per cent. It is estimated that the canned pears exported from the country during this same period have utilized nearly 6 per cent of the crop, the percentage varying from about 4.5 to 6.5. Since a large part of our small output of dried pears is exported, it is probable that on the average in recent years about one-eighth of the national pear crop has found an outlet in foreign markets.

*Upward Trend of Fresh-Pear Exports.*—Figure 12 depicts the very apparent upward trend in the value (in terms of dollars of pre-war value<sup>34</sup>) of fresh-pear exports from the United States in the years since the war, as compared with the period before the war. That the general decline from 1914 through 1918 was a temporary result of the war seems to be indicated by the very decided upward trend in the value of exports beginning in 1919. Data on the quantity of pears exported from the United States are available for the years 1922 to date only. These data, which are presented in table 10, like those on value in figure 12 show the tendency for exports of fresh pears to increase in the last five years.

<sup>33</sup> The footnote to table 8 itemizes the average costs used in computing the estimated equivalent at California ranches from the eastern delivered-auction price. The following illustrations of the wide range of the cost of certain operations are given by Hansen and Holmes (Marketing California pears, 1926. U. S. Bur. Agr. Econ. Cir. (mimeo.), pp. 25-27. June, 1927.) "The wiping of pears by hand or machine will vary, ranging from 2 to 7 cents per box. If the fruit is precooled an additional charge of approximately 7 cents per box should be added to the packing charge. The cost of box shock varies according to the delivery point and amount purchased. Some growers or packers do not always take into account the rental of the packing house. Packing and hauling in Mendocino or Lake County is estimated to run as high as 75 cents per box, on account of the longer hauling distance for supplies and the packed fruit." The freight rate of \$1.60 per cwt. is used, covering points to Omaha and east. Refrigeration charges to different markets range from \$75 to \$110 a car, according to the market, the rate to New York being \$105 and to Chicago \$90.

Most California Bartletts are not stored but the majority of the late varieties of pears are. In estimating the farm price equivalent to the eastern delivered-auction price of pears which have been in cold storage it is therefore necessary to subtract the storage and other charges incidental to storing from the auction price in addition to the total charges given in table 8. See footnote 32, page 40, for the usual charges incidental to cold storage.

<sup>34</sup> See explanation of purchasing power in footnote 28, page 36.

Official British statistics show that the United Kingdom has imported a much greater quantity of fresh pears in recent years than before the war. During the period 1909 to 1913 the British imported an average of about 280,000 boxes of pears a year from us, compared with a yearly average of about 464,000 in the five years 1921-1925. This change represents an increase of about 65 per cent. Since the British have taken from one-third to one-half of our total exports of fresh pears in recent years, these figures help to substantiate the apparent upward trend of the total quantity of fresh pears exported from this country in recent years.

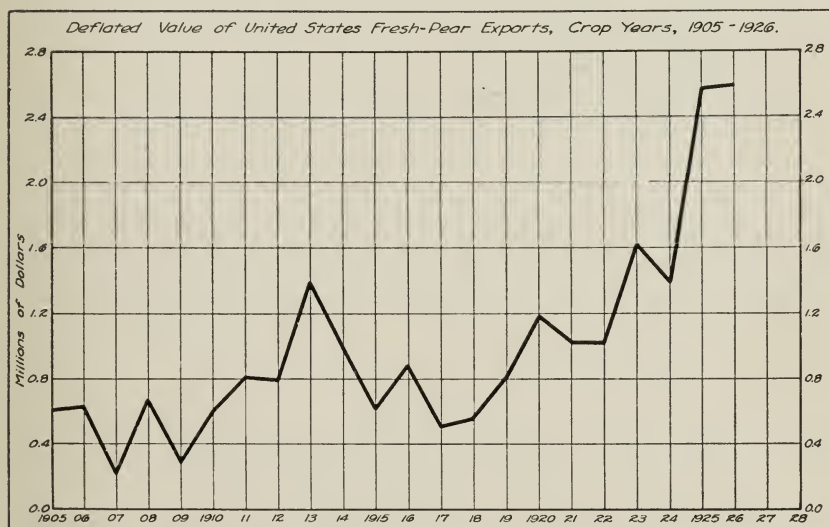


Fig. 12.—Aside from a temporary decline in fresh-pear exports from 1910 through 1918, due to the war, the general trend has been rapidly upward in the last twenty years.

(Data from table 9, page 47.)

*Position of Our Fresh-Pear Exports in British Isles.*—The fact that the United Kingdom and Canada together have taken from 80 to 90 per cent of our fresh-pear exports in the last five years (see table 10) justifies a brief discussion of the position of our pear exports in these two countries. The United Kingdom, the only European importer of American fresh pears of any importance, has been the destination of from one-third to one-half of our total fresh-pear exports during the last five years, averaging 43 per cent. From the point of view of the United Kingdom, British imports of fresh pears from the United States during the same period have ranged from

10 to 56 per cent of the total imports, averaging about 17 per cent, and giving us a rank of third among foreign sources of British supplies.<sup>35</sup>

France and Belgium, the two chief sources of fresh pears consumed in the British Isles, supply a substantial majority of the imports and have done so for many years. In recent years the home production of pears appears to have constituted only about one-fourth of the supply of fresh pears consumed in the British Isles. Dutch pears are imported into England to some extent, likewise, although they find their readiest foreign outlet in German industrial areas. Very few pears from Czechoslovakia, an outstanding European pear-producing and exporting country, reach the English market, most of its exports going to Germany and Scandinavia.

Supplies from the British dominions of South Africa and Australia, which reach the British market largely from January to May, constitute only 5 to 10 per cent of British consumption. Since at least 95 per cent of our fresh pears exported to the United Kingdom are moved in the six months from July through December, the outlook for the bulk of our fresh-pear exports in the British market can scarcely be expected to be appreciably affected by developments in these two countries. Their present and probable future influence in the British canned-pear market, however, cannot be so lightly regarded.<sup>36</sup> Likewise, considering the relatively rapid expansion in the last fifteen years of fresh-pear shipments into the United Kingdom from these countries during the winter and early spring, it would seem that American exports of late winter pears may feel increasing competition from these two countries. At present, however, the fruit industry of South Africa is relatively small and there is little likelihood that this country will become a very important contributor to the world production and trade in fresh, canned, and dried fruits for another generation or so.

Considerable encouragement to American shippers seeking to expand their sales of fresh pears in European markets may be taken from the statement by Smith that "European pear production does not threaten our present markets, nor does it promise to check the

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<sup>35</sup> This discussion of fresh-pear imports into the United Kingdom is based primarily upon: British Imperial Economic Committee Report on marketing and preparing for market of foodstuffs produced in the overseas parts of the Empire, Third Report—Fruit, pp. 150–152. 1926; and also upon U. S. Dept. Agr., Bur. Agr. Econ. Foreign News on Fruit, mimeographed releases, embodying foreign statistics and market news on fruits gathered largely by Edwin Smith, the Bureau's Fruit Specialist in Foreign Marketing, who is stationed in Europe.

<sup>36</sup> See discussion, pages 94–97.

TABLE 9

VALUE AND PURCHASING POWER OF FRESH-PEAR EXPORTS FROM THE  
UNITED STATES, CROP YEARS 1905-1926

| Year<br>beginning<br>July 1 | Value      | Purchasing<br>power | All-<br>commodity<br>wholesale-<br>price index | Year<br>beginning<br>July 1 | Value      | Purchasing<br>power | All-<br>commodity<br>wholesale-<br>price index |
|-----------------------------|------------|---------------------|------------------------------------------------|-----------------------------|------------|---------------------|------------------------------------------------|
| 1                           | 2          | 3                   | 4                                              | 1                           | 2          | 3                   | 4                                              |
| 1905                        | \$ 631,972 | \$ 710,081          | 89                                             | 1917                        | \$ 978,298 | \$ 514,894          | 190                                            |
| 1906                        | 675,944    | 726,822             | 93                                             | 1918                        | 1,105,181  | 541,755             | 204                                            |
| 1907                        | 288,918    | 307,360             | 94                                             | 1919                        | 1,857,809  | 804,246             | 231                                            |
| 1908                        | 546,198    | 574,945             | 95                                             | 1920                        | 2,215,000  | 1,184,492           | 187                                            |
| 1909                        | 302,958    | 291,306             | 104                                            | 1921                        | 1,477,128  | 1,018,709           | 145                                            |
| 1910                        | 578,067    | 595,945             | 97                                             | 1922                        | 1,616,850  | 1,016,887           | 159                                            |
| 1911                        | 784,627    | 808,894             | 97                                             | 1923                        | 2,498,950  | 1,633,301           | 153                                            |
| 1912                        | 796,913    | 781,287             | 102                                            | 1924                        | 2,253,383  | 1,426,192           | 158                                            |
| 1913                        | 1,402,924  | 1,389,034           | 101                                            | 1925                        | 4,083,135  | 2,568,009           | 159                                            |
| 1914                        | 992,497    | 982,670             | 101                                            | 1926                        | 3,983,918  | 2,595,945           | 150                                            |
| 1915                        | 691,732    | 612,152             | 113                                            | 1927                        |            |                     |                                                |
| 1916                        | 1,356,259  | 875,006             | 155                                            | 1928                        |            |                     |                                                |

Source of data:

Col. 2.—The primary source of exports for all years is publications of the U. S. Department of Commerce. Data for 1905-1919 from compilation in Amer. Pomological Society Proc. **36-37, (1920): 196**; for the year 1920 from U. S. Dept. Agr. Yearbook **1923**; for the years 1921-1926 compiled from Monthly Summary of Foreign Commerce.

Col. 3.—Items in col. 2 divided by items for corresponding year in col. 4 and multiplied by 100.

Col. 4.—U. S. Dept. Labor all-commodity wholesale-price index for the United States for years corresponding to those in col. 1.

TABLE 10

EXPORTS OF FRESH PEARS FROM THE UNITED STATES BY CHIEF COUNTRIES OF  
DESTINATION, CALENDAR YEARS 1922-1926  
(In thousands of pounds, i.e., 000 omitted.)

| Destination    | Average<br>1922-1926     |             | 1926                     |             | 1925                     |             | 1924                     |             | 1923                     |             | 1922                     |             |
|----------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|
|                | Thou-<br>sands<br>of lb. | Per<br>cent | Thou-<br>sands<br>of lb. | Per<br>cent | Thou-<br>sands<br>of lb. | Per<br>cent | Thou-<br>sands<br>of lb. | Per<br>cent | Thou-<br>sands<br>of lb. | Per<br>cent | Thou-<br>sands<br>of lb. | Per<br>cent |
| United Kingdom | 23,222                   | 43.1        | 29,971                   | 43.7        | 35,895                   | 48.8        | 14,319                   | 34.5        | 23,568                   | 46.0        | 12,359                   | 36.2        |
| Canada         | 22,808                   | 42.4        | 27,909                   | 40.7        | 25,933                   | 35.2        | 20,845                   | 50.1        | 21,628                   | 42.3        | 17,726                   | 52.0        |
| Brazil         | 2,568                    | 4.8         | 4,331                    | 6.3         | 4,493                    | 6.1         | 1,944                    | 4.7         | 1,261                    | 2.5         | 812                      | 2.4         |
| Cuba           | 2,138                    | 4.0         | 2,062                    | 3.0         | 2,163                    | 2.9         | 2,267                    | 5.5         | 2,474                    | 4.8         | 1,726                    | 5.0         |
| Argentina      | 1,222                    | 2.3         | 2,200                    | 3.0         | 1,557                    | 2.1         | 896                      | 2.2         | 884                      | 1.7         | 574                      | 1.7         |
| Mexico         | 664                      | 1.2         | 593                      | 0.9         | 636                      | 0.9         | 719                      | 1.7         | 757                      | 1.5         | 614                      | 1.8         |
| Others         | 1,207                    | 2.2         | 1,675                    | 2.4         | 2,925                    | 4.0         | 526                      | 1.3         | 614                      | 1.2         | 294                      | 0.9         |
| Total          | 53,829                   | 100.0       | 68,741                   | 100.0       | 73,602                   | 100.0       | 41,516                   | 100.0       | 51,186                   | 100.0       | 34,105                   | 100.0       |

Source of data: Exports in approximate net pounds, exclusive of weight of package, as compiled by the U. S. Bureau of Foreign and Domestic Commerce from annual numbers of Foreign Commerce and Navigation of the United States for the years 1922-1925. Year 1926 from Commerce Reports **1926(15): 88, 1927**. Quantities exported are not available prior to 1922. Averages 1922-1926 and percentages of the total exports of fresh pears for each year computed by the author.

gradual extension of our outlets across the Atlantic.”<sup>37</sup> Fraser is also optimistic over the prospects for an expansion of our fresh-pear exports to European markets. He states that “one of the finest openings for fruit is the British market for winter pears. . . . A pear satisfactory to the Christmas trade will have little opposition in the British markets because the French and Belgian pears are difficult to keep so late.”<sup>38</sup>

*Canadian Production, Imports, and Exports.*—Canada is the only portion of the British Empire whose exports of fresh pears arrive upon the British market at a time to compete with the bulk of our supplies. Such competition as we have met or probably will meet from Canadian fresh-pear exports to the British market, however, cannot be considered serious. Considerably less than 5 per cent of the supply of fresh pears consumed in the British Isles in recent years has been contributed by Canada, which does not on the average produce enough for its own consumption.

The Canadian market is a close second to the British Isles among our foreign markets for fresh pears. Like the British Isles, Canada has taken from one-third to one-half of the total fresh-pear exports from the United States in recent years, the two markets tending to alternate in the position of first place. Canadian imports have averaged 42 per cent of the United States exports of fresh pears in the last five years, or 1 per cent less than the British Isles. Approximately 99 per cent of the total Canadian imports of fresh pears have come from the United States in recent years. Fresh-pear exports from the United States into Canada greatly exceed total Canadian exports and have been increasing in recent years. Moreover, Canadian production of pears in the last few years has been decreasing, and both bearing and non-bearing acreage of pears in 1921 were slightly smaller than in 1911.<sup>39</sup> Thus it would seem that the Canadian market as an outlet for our pears promises to be an expanding one.

*Minor Foreign Markets for Fresh Pears.*—Compared with the British and Canadian imports of our fresh pears, the other four importing countries shown individually in table 10, are relatively unimportant outlets for our fruit. These four markets—Brazil, Cuba, Argentina, and Mexico—have together taken 13 per cent of the fresh-pear exports from the United States in the five years 1922–1926. However, these markets, although relatively small, may develop in the future.

<sup>37</sup> U. S. Dept. Agr., Bureau Agr. Econ. Foreign News on Apples (mimeo.), 52: 6. 1926.

<sup>38</sup> Fraser, Samuel. American fruits, pp. 387, 388. Orange Judd Pub. Co., New York. 1924.

<sup>39</sup> Canadian Dom. Bur. Stat. Canadian Yearbook 1924: 246. 1925.

TABLE 11  
PEAR UNLOADS OR ARRIVALS IN CERTAIN CITIES BY CHIEF SECTIONS OF ORIGIN, 1925 AND 1926

| City                    | From all states |                                   | From Pacific Coast |                                              |                                       | From Oregon and Washington |                                               |                                       | From California |                                    |                                       |
|-------------------------|-----------------|-----------------------------------|--------------------|----------------------------------------------|---------------------------------------|----------------------------|-----------------------------------------------|---------------------------------------|-----------------|------------------------------------|---------------------------------------|
|                         | Unloads<br>cars | Per cent<br>of U. S.<br>shipments | Unloads<br>cars    | Per cent<br>of Pacific<br>Coast<br>shipments | Per cent of<br>each city's<br>unloads | Unloads<br>cars            | Per cent of<br>Ore. and<br>Wash.<br>shipments | Per cent of<br>each city's<br>unloads | Unloads<br>cars | Per cent of<br>Calif.<br>shipments | Per cent of<br>each city's<br>unloads |
| <i>1926 Total</i> ..... | 14,854          | 60.2                              | 11,630             | 60.2                                         | 78                                    | 4,326                      | 61.3                                          | 29                                    | 7,304           | 61.4                               | 49                                    |
| Boston.....             | 803             | 3.3                               | 751                | 3.9                                          | 93                                    | 168                        | 2.1                                           | 21                                    | 583             | 5.1                                | 73                                    |
| New York.....           | 7,973           | 32.3                              | 5,734              | 29.6                                         | 72                                    | 2,236                      | 28.0                                          | 28                                    | 3,498           | 30.8                               | 43                                    |
| Pittsburg.....          | 372             | 1.5                               | 270                | 1.4                                          | 72                                    | 107                        | 1.3                                           | 29                                    | 163             | 1.4                                | 44                                    |
| Philadelphia.....       | 1,012           | 4.1                               | 953                | 5.0                                          | 95                                    | 375                        | 4.8                                           | 32                                    | 578             | 5.1                                | 57                                    |
| Chicago.....            | 2,364           | 10.4                              | 2,090              | 10.8                                         | 81                                    | 1,212                      | 15.3                                          | 48                                    | 878             | 7.7                                | 34                                    |
| St. Louis.....          | 222             | 0.9                               | 162                | 0.8                                          | 73                                    | 65                         | 0.8                                           | 29                                    | 97              | 0.9                                | 46                                    |
| Minneapolis.....        | 242             | 1.0                               | 147                | 0.8                                          | 61                                    | 72                         | 0.9                                           | 30                                    | 75              | 0.7                                | 31                                    |
| Kansas City.....        | 87              | 0.3                               | 59                 | 0.3                                          | 68                                    | 27                         | 0.3                                           | 31                                    | 32              | 0.3                                | 37                                    |
| Denver.....             | 125             | 0.5                               | 21                 | 0.2                                          | 17                                    | 7                          | 0.1                                           | 6                                     | 14              | 0.1                                | 11                                    |
| Los Angeles.....        | 647             | 2.6                               | 636                | 3.3                                          | 98                                    | 27                         | 0.3                                           | 4                                     | 609             | 5.4                                | 94                                    |
| San Francisco.....      | 807             | 3.3                               | 807                | 4.2                                          | 100                                   | 30                         | 0.4                                           | 4                                     | 777             | 6.9                                | 96                                    |
| <i>1925 Total</i> ..... | 10,743          | 62.9                              | 7,436              | 61.9                                         | 70                                    | 2,903                      | 38.0                                          | 20                                    | 5,333           | 61.0                               | 60                                    |
| Boston.....             | 481             | 2.4                               | 463                | 3.2                                          | 96                                    | 69                         | 1.2                                           | 14                                    | 394             | 4.5                                | 82                                    |
| Philadelphia.....       | 921             | 4.5                               | 518                | 3.6                                          | 56                                    | 173                        | 3.0                                           | 19                                    | 345             | 3.9                                | 38                                    |
| Pittsburg.....          | 514             | 2.5                               | 187                | 1.3                                          | 36                                    | 44                         | 0.8                                           | 9                                     | 143             | 0.1                                | 28                                    |
| New York.....           | 5,096           | 25.2                              | 3,642              | 25.0                                         | 72                                    | 1,079                      | 18.6                                          | 21                                    | 2,563           | 31.0                               | 50                                    |
| Cincinnati.....         | 130             | 0.6                               | 63                 | 0.4                                          | 48                                    | 8                          | 0.1                                           | 6                                     | 55              | 0.6                                | 42                                    |
| Chicago.....            | 1,890           | 9.3                               | 1,414              | 9.8                                          | 75                                    | 645                        | 11.2                                          | 34                                    | 769             | 8.8                                | 40                                    |
| Kansas City.....        | 104             | 0.5                               | 78                 | 0.5                                          | 76                                    | 39                         | 0.7                                           | 37                                    | 39              | 0.4                                | 37                                    |
| St. Paul.....           | 92              | 0.5                               | 38                 | 0.4                                          | 63                                    | 21                         | 0.4                                           | 23                                    | 37              | 0.4                                | 40                                    |
| Minneapolis.....        | 198             | 1.0                               | 87                 | 0.6                                          | 44                                    | 39                         | 0.7                                           | 20                                    | 48              | 0.6                                | 24                                    |
| St. Louis.....          | 185             | 0.9                               | 108                | 0.8                                          | 58                                    | 32                         | 0.5                                           | 17                                    | 76              | 0.9                                | 41                                    |
| Atlanta.....            | 41              | 0.2                               | 23                 | 0.2                                          | 56                                    | 14                         | 0.2                                           | 34                                    | 9               | 0.1                                | 22                                    |
| Denver.....             | 103             | 0.5                               | 26                 | 0.2                                          | 25                                    | 7                          | 0.1                                           | 7                                     | 19              | 0.2                                | 18                                    |
| San Francisco.....      | 691             | 3.4                               | 590                | 4.1                                          | 84                                    | 25                         | 0.4                                           | 3                                     | 565             | 6.5                                | 82                                    |
| Los Angeles.....        | 271             | 1.3                               | 269                | 1.8                                          | 99                                    | .....                      | .....                                         | .....                                 | 269             | 3.0                                | 99                                    |

Sources of data: Data for New York and Chicago are arrivals and for all other cities are unloads. The term "unloads" refers to arrivals minus diversions to other markets.

Carlot unloads for 1925 are from Hansen, C. J. and O. W. Holmes, California pear deal, 1925. U. S. Bur. of Agr. Econ., mimeographed release, pp. 15-19; and for 1926 a similar release by the same authors. Marketing California pears in 1926, pp. 17-20. All percentages computed from carlot unloads as given in this table or from data on carlot shipments in table 32, page 103.

TABLE 12  
MONTHLY CARLOT SHIPMENTS OF FRESH PEARS BY CHIEF STATES AND GROUPS,  
1924-1927

| Crop year and month      | U. S. total   | Washington-Oregon total |           | California    |             |                    |             |                   |             |                    |            |
|--------------------------|---------------|-------------------------|-----------|---------------|-------------|--------------------|-------------|-------------------|-------------|--------------------|------------|
|                          |               |                         |           | Total         |             | Northern district† |             | Central district† |             | Southern district† |            |
|                          |               | Cars                    | Per cent  | Cars          | Per cent    | Cars               | Per cent    | Cars              | Per cent    | Cars               | Per cent   |
| <i>1924 Total</i> .....  | <i>16,246</i> | <i>3,791</i>            | <i>23</i> | <i>6,306</i>  | <i>39</i>   | <i>4,321</i>       | <i>27</i>   | <i>1,845</i>      | <i>11</i>   | <i>140</i>         | <i>1</i>   |
| June.....                | 228           | 0                       | 0         | 228           | 100         | 227                | 99          | 1                 | 1           | 0                  | 0          |
| July.....                | 2,887         | 73                      | 3         | 2,780         | 96          | 2,410              | 83          | 368               | 13          | 2                  | 0          |
| August.....              | 4,744         | 1,533                   | 32        | 2,442         | 52          | 1,601              | 34          | 730               | 16          | 111                | 2          |
| September.....           | 4,652         | 1,531                   | 33        | 574           | 12          | 70                 | 2           | 487               | 10          | 17                 | 0          |
| October.....             | 2,831         | 442                     | 16        | 216           | 7           | 12                 | 0           | 201               | 7           | 3                  | 0          |
| November.....            | 550           | 132                     | 24        | 47            | 8           | 0                  | 0           | 40                | 7           | 7                  | 1          |
| December.....            | 103           | 55                      | 53        | 7             | 7           | 1                  | 1           | 6                 | 6           | 0                  | 0          |
| January.....             | 113           | 5                       | 4         | 2             | 2           | 0                  | 0           | 2                 | 2           | 0                  | 0          |
| February.....            | 87            | 2                       | 2         | 3             | 3           | 0                  | 0           | 3                 | 3           | 0                  | 0          |
| March.....               | 37            | 5                       | 13        | 7             | 19          | 0                  | 0           | 7                 | 19          | 0                  | 0          |
| April.....               | 14            | 13                      | 93        | 0             | 0           | 0                  | 0           | 0                 | 0           | 0                  | 0          |
| <i>1925 Total</i> .....  | <i>21,272</i> | <i>5,804</i>            | <i>27</i> | <i>8,691</i>  | <i>41</i>   | <i>6,676</i>       | <i>31</i>   | <i>1,866</i>      | <i>9</i>    | <i>149</i>         | <i>1</i>   |
| June.....                | 14            | 0                       | 0         | 13            | 93          | 13                 | 93          | 0                 | 0           | 0                  | 0          |
| July.....                | 3,961         | 31                      | 1         | 3,804         | 96          | 3,484              | 88          | 320               | 8           | 0                  | 0          |
| August.....              | 6,851         | 1,823                   | 27        | 3,606         | 53          | 2,818              | 41          | 724               | 11          | 64                 | 1          |
| September.....           | 6,593         | 2,479                   | 38        | 929           | 14          | 337                | 5           | 529               | 8           | 63                 | 1          |
| October.....             | 2,830         | 826                     | 29        | 252           | 9           | 24                 | 1           | 220               | 8           | 8                  | 0          |
| November.....            | 405           | 230                     | 57        | 40            | 10          | 0                  | 0           | 26                | 6           | 14                 | 4          |
| December.....            | 110           | 58                      | 53        | 11            | 10          | 0                  | 0           | 11                | 10          | 0                  | 0          |
| January.....             | 176           | 128                     | 73        | 0             | 0           | 0                  | 0           | 0                 | 0           | 0                  | 0          |
| February.....            | 164           | 117                     | 71        | 9             | 5           | 0                  | 0           | 9                 | 5           | 0                  | 0          |
| March.....               | 120           | 72                      | 60        | 25            | 18          | 0                  | 0           | 25                | 18          | 0                  | 0          |
| April.....               | 31            | 22                      | 71        | 1             | 3           | 0                  | 0           | 1                 | 3           | 0                  | 0          |
| May.....                 | 2             | 2                       | 100       | 1             | 50          | 0                  | 0           | 1                 | 50          | 0                  | 0          |
| <i>1926* Total</i> ..... | <i>24,863</i> | <i>8,101</i>            | <i>33</i> | <i>11,358</i> | <i>46</i>   | <i>8,820</i>       | <i>35</i>   | <i>2,438</i>      | <i>10</i>   | <i>100</i>         | <i>+</i>   |
| June.....                | 862           | 0                       | 0         | 862           | 100         | 860                | 100         | 2                 | 0           | 0                  | 0          |
| July.....                | 6,072         | 398                     | 7         | 5,654         | 93          | 4,565              | 75          | 1,089             | 18          | 0                  | 0          |
| August.....              | 7,569         | 3,112                   | 40        | 3,632         | 47          | 2,962              | 39          | 648               | 8           | 22                 | 0          |
| September.....           | 6,045         | 2,910                   | 48        | 819           | 14          | 399                | 7           | 406               | 7           | 14                 | 0          |
| October.....             | 2,771         | 650                     | 23        | 253           | 9           | 34                 | 1           | 182               | 7           | 37                 | 1          |
| November.....            | 635           | 318                     | 50        | 91            | 14          | 0                  | 0           | 65                | 10          | 26                 | 4          |
| December.....            | 302           | 231                     | 77        | 15            | 5           | 0                  | 0           | 14                | 5           | 1                  | 0          |
| January.....             | 218           | 166                     | 76        | 6             | 3           | 0                  | 0           | 6                 | 3           | 0                  | 0          |
| February.....            | 229           | 189                     | 83        | 10            | 5           | 0                  | 0           | 10                | 5           | 0                  | 0          |
| March.....               | 123           | 100                     | 81        | 13            | 11          | 0                  | 0           | 13                | 11          | 0                  | 0          |
| April.....               | 37            | 27                      | 73        | 3             | 8           | 0                  | 0           | 3                 | 8           | 0                  | 0          |
| May.....                 | 0             | 0                       | 0         | 0             | 0           | 0                  | 0           | 0                 | 0           | 0                  | 0          |
| <i>1927* Total</i> ..... | <i>17,896</i> | <i>5,059</i>            | <i>28</i> | <i>8,992</i>  | <i>50.2</i> | <i>7,121</i>       | <i>39.8</i> | <i>1,803</i>      | <i>10.1</i> | <i>68</i>          | <i>0.0</i> |
| June.....                | .....         | .....                   | .....     | .....         | .....       | .....              | .....       | .....             | .....       | .....              | .....      |
| July.....                | 2,296         | .....                   | .....     | 2,174         | 95          | 2,147              | 94          | 27                | 1           | .....              | .....      |
| August.....              | 6,914         | 1,078                   | 16        | 4,947         | 72          | 3,854              | 56          | 1,084             | 16          | 9                  | 0          |
| September.....           | 5,630         | 2,722                   | 48        | 1,459         | 26          | 1,066              | 19          | 380               | 7           | 13                 | 0          |
| October.....             | 2,307         | 866                     | 38        | 279           | 12          | 52                 | 2           | 213               | 9           | 14                 | 1          |
| November.....            | 511           | 220                     | 43        | 104           | 20          | 1                  | 0           | 77                | 15          | 26                 | 5          |
| December.....            | 238           | 173                     | 73        | 29            | 12          | 1                  | 0           | 22                | 9           | 6                  | 2          |

See footnotes on opposite page.

## CHIEF DOMESTIC MARKETS FOR CALIFORNIA PEARS

Table 11 shows that over 60 per cent of the fresh-pear shipments from California were unloaded in about a dozen large cities in 1925 and 1926. Over half of the shipments were unloaded in a few large cities lying north of the Mason and Dixon line and east of the Mississippi River; New York alone, with its vast trading radius, received about 30 per cent; and Chicago, Boston, and Philadelphia, the other more important markets, unloaded between 17 and 18 per cent in 1925 and 1926.

## MONTHLY VARIATION IN MOVEMENT

*United States Shipments Heavy from July to October.*—In the last three years nearly 95 per cent of the national earlot shipments of pears have moved in the four months from July to October inclusive. Practically all of the remainder have rolled to market in gradually diminishing monthly quantities during the period from November to May each year. In a few recent years early shipments from California in June have also been appreciable (see table 12), notably in 1926, an abnormally early season in which nearly 9 per cent of the pear shipments from the state moved in this one month. During the three years 1924–1926 an average of about 30 per cent of the total pear shipments of the country have rolled in August, approximately 28 per cent in September, 18 per cent in July, 14 per cent in October, and less than 3 per cent in November. The general tendency, however, in recent years has been for heavy pear shipments throughout the period from the middle of July to the middle of September (see figure 13). The major peak of weekly shipments has varied from about the middle of August to the third week in September, being determined largely by the relative earliness or lateness and the relative seasonal variations in the quantities of pears shipped from each of three chief commercial pear-producing sections—California, the Pacific Northwest, and New York.

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(Footnotes to table 12 on opposite page):

\* Data for 1926 and 1927 are preliminary, incomplete, and subject to considerable revision. The United States total for 1926 in this table accounts for only 24,863 carloads by months, whereas the cumulative total for the season revised to April 30, 1927, is 25,283, leaving a balance of 420 cars not accounted for in the preliminary monthly data exhibited in this table. Data for 1924 are final figures and those for 1925 are subject to minor revisions only.

† The California districts correspond to those demarcated on the map of California shown in figure 5, page 30, except that the data for the southern district in this table includes shipments from Imperial Valley.

Sources of data: Data for 1924 and 1926 (calendar years) compiled from mimeographed summaries of monthly carload shipments of pears by states issued by the U. S. Bur. Agr. Econ.; for 1925 and 1927 (calendar years) compiled from monthly issues of Crops and Markets.

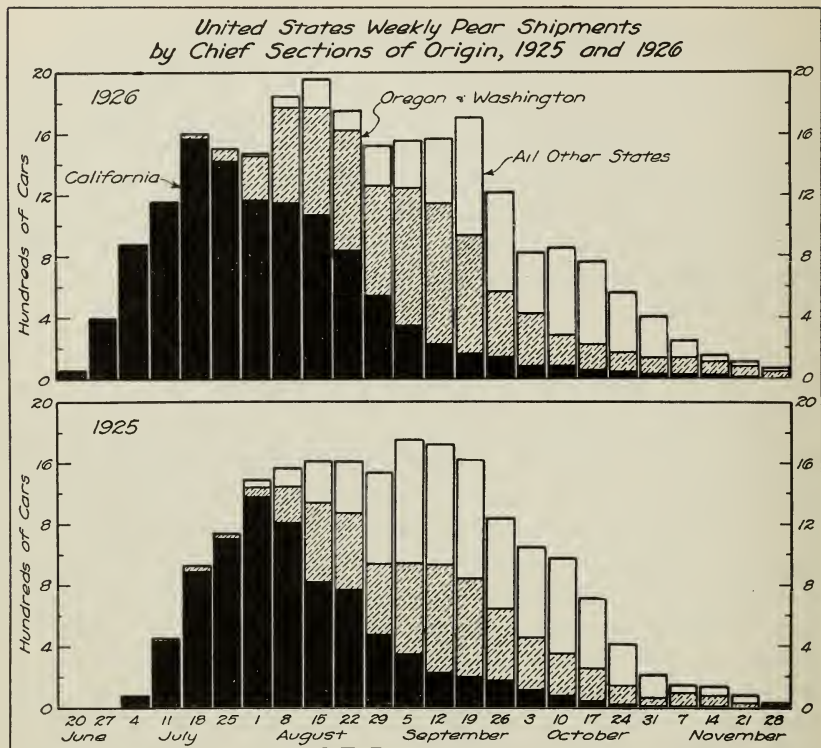


Fig. 13.—California Bartlett pear shipments dominate the eastern market the first six weeks of the shipping season. Pacific Northwest pears begin to roll in appreciable and rapidly increasing quantities about the time of the peak of California shipments.

(Data from table 18, page 66.)

*Pacific Coast Usually Leads Until September.*—In the three years 1924–1926, pear shipments from the Pacific Coast have averaged over 90 per cent of national shipments in the months of July and August. Heavy shipments from California alone are responsible for an average of about 4,300 cars of pears (about 18 per cent of the national annual shipments) during July. August shipments, which have averaged nearly 6,400 cars during this same three-year period, are usually larger than those of any other month, as one-third to one-half of the heavy movement from California to the East rolls in this month, nearly 40 per cent of Pacific Northwest shipments, and a small proportion, but appreciable quantity, of eastern pears.

*Eastern Pears Move Largely in September and October.*—National pear shipments in September, which averaged nearly 5,800 carloads in the three years 1924–1926, have been nearly as large as those in

August. California shipments are relatively small in this month, but those from the Pacific Northwest are usually large, being about as heavy as in August. In addition, heavy shipments from the eastern states are made in September. From two-thirds to three-fourths of the average October shipments of 2,800 cars originate in states east of the Rocky Mountains, the peak occurring in either September or October. (See figure 20, page 71.) The pears originating in the east do not, however, have nearly as much effect on the price of California boxed pears as a corresponding volume from California or the Pacific Northwest would have.

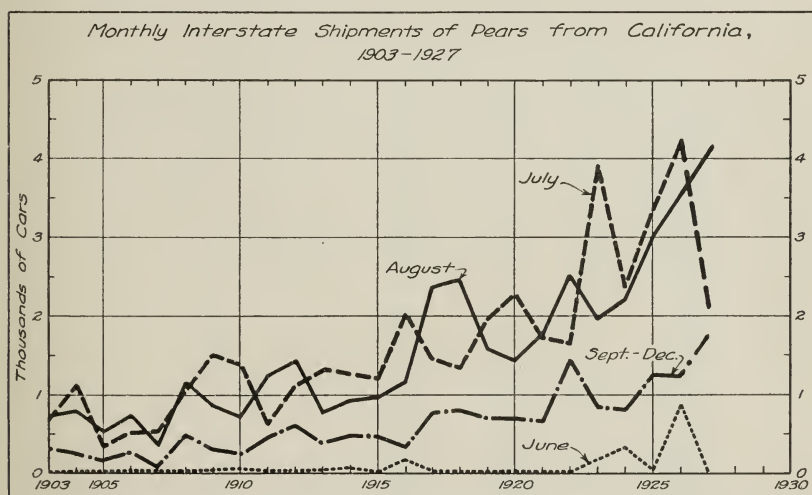


Fig. 14.—In the last 20 years there has been a tremendous increase in shipments of pears from California, particularly in July and August.

(Data from table 13.)

About two-thirds of the November shipments of approximately 500 carloads of pears have been of eastern origin in recent years. After November most pear shipments come from cold-storage stocks. In recent years they have come chiefly from the Pacific Coast, particularly Oregon and Washington. New York, however, usually contributes a portion of this winter and spring movement.

*Monthly California Interstate Shipments, 1903-1927.*<sup>40</sup>—Figure 14 shows the great increase in the July and August movement of pears

<sup>40</sup> Until very recently practically all the interstate shipments of pears from California originated north of the Tehachapi range. The monthly interstate shipments from the state as shown in table 13 are therefore, a reliable indicator of the changes which have occurred in the seasonal movement of shipments from the whole state during the last two decades. These are the only available data which exclude carlot shipments of California pears to the canneries in the state.

TABLE 13

CALIFORNIA INTERSTATE PEAR SHIPMENTS, ANNUAL 1895-1927, MONTHLY  
1903-1927  
(All classes of equipment.)

| Annual shipments 1895-1902, in cars |       |       |       |       |       |       |       |       |
|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Year                                | 1895  | 1896  | 1897  | 1898  | 1899  | 1900  | 1901  | 1902  |
| Carlots                             | 1,187 | 1,624 | 1,640 | 1,595 | 1,684 | 2,115 | 1,535 | 2,011 |

| Monthly and annual shipments 1903-1926, in cars |       |      |       |       |       |      |      |      |
|-------------------------------------------------|-------|------|-------|-------|-------|------|------|------|
| Year                                            | Total | June | July  | Aug.  | Sept. | Oct. | Nov. | Dec. |
| 1903                                            | 1,720 | 3    | 684   | 727   | 215   | 62   | 29   | 0    |
| 1904                                            | 2,186 | 5    | 1,149 | 808   | 187   | 34   | 3    | 0    |
| 1905                                            | 1,013 | 4    | 319   | 537   | 123   | 29   | 1    | 0    |
| 1906                                            | 1,513 | 4    | 531   | 749   | 197   | 31   | 1    | 0    |
| 1907                                            | 1,039 | 14   | 598   | 358   | 66    | 3    | 0    | 0    |
| 1908                                            | 2,702 | 11   | 1,040 | 1,155 | 408   | 82   | 4    | 2    |
| 1909                                            | 2,638 | 24   | 1,502 | 864   | 208   | 40   | 0    | 0    |
| 1910                                            | 2,361 | 43   | 1,383 | 713   | 191   | 31   | 0    | 0    |
| 1911                                            | 2,325 | 5    | 610   | 1,246 | 276   | 169  | 19   | 0    |
| 1912                                            | 3,135 | 4    | 1,101 | 1,425 | 445   | 135  | 25   | 0    |
| 1913                                            | 2,496 | 29   | 1,317 | 783   | 256   | 109  | 2    | 0    |
| 1914                                            | 2,725 | 60   | 1,258 | 921   | 350   | 124  | 12   | 0    |
| 1915                                            | 2,646 | 8    | 1,194 | 977   | 359   | 81   | 27   | 0    |
| 1916                                            | 3,701 | 175  | 2,036 | 1,166 | 245   | 75   | 4    | 0    |
| 1917                                            | 4,802 | 12   | 1,459 | 2,367 | 698   | 212  | 50   | 4    |
| 1918                                            | 4,571 | 2    | 1,334 | 2,458 | 415   | 287  | 75   | 0    |
| 1919                                            | 4,248 | 2    | 1,968 | 1,581 | 459   | 186  | 51   | 1    |
| 1920                                            | 4,391 | 6    | 2,257 | 1,432 | 365   | 263  | 63   | 5    |
| 1921                                            | 4,294 | 3    | 1,686 | 1,868 | 367   | 271  | 94   | 2    |
| 1922                                            | 5,755 | 5    | 1,648 | 2,587 | 1,047 | 272  | 160  | 32   |
| 1923                                            | 7,036 | 198  | 3,871 | 2,075 | 504   | 283  | 83   | 6    |
| 1924                                            | 5,821 | 331  | 2,380 | 2,235 | 556   | 235  | 51   | 16   |
| 1925                                            | 7,822 | 49   | 3,373 | 3,066 | 931   | 282  | 52   | 14   |
| 1926                                            | 9,897 | 853  | 4,276 | 3,473 | 912   | 206  | 70   | 36   |
| 1927                                            | 8,200 | 5    | 2,090 | 4,192 | 1,345 | 293  | 95   | 33   |
| 1928                                            |       |      |       |       |       |      |      |      |

\* Data for 1927 are preliminary and subject to revision.

Sources of data: Data for 1895-1920 include interstate shipments from north of Tehachapi only, since these are the only data available for these years. Estimates indicate that shipments from south of Tehachapi, however, were inconsequential before 1915. They may have totaled about 100 cars in some of the years between then and 1921, in which year they amounted to 123 carloads.

Annual total 1895-1920 compiled from California Fruit News; monthly data from compilations by the California Fruit Distributors.

Data for 1921-1927 include interstate shipments from both north and south of Tehachapi and are from compilations by the carriers. They include all refrigerator car and express shipments but do not include a very small movement in box cars in a few years. The annual total for 1921 to 1926 are for crop years; they include shipments in addition to those shown by individual months. See table 31 (p. 102) for interstate shipments from north of Tehachapi for 1921-1927.

from the state during the last twenty years. During the last five years, 1922-1926, July shipments have averaged over 3,100 carloads, or about 2.8 times the pre-war average; August shipments, nearly 2,700 cars, about 2.7 times the pre-war average; and June shipments, 275 cars, or nearly 10 times this average. Thus the total pear shipments from the state for June, July, and August during these five years have averaged approximately 2.8 times the pre-war figure, or over 6,000 carloads, constituting about 84 per cent of the total annual interstate movement from California.

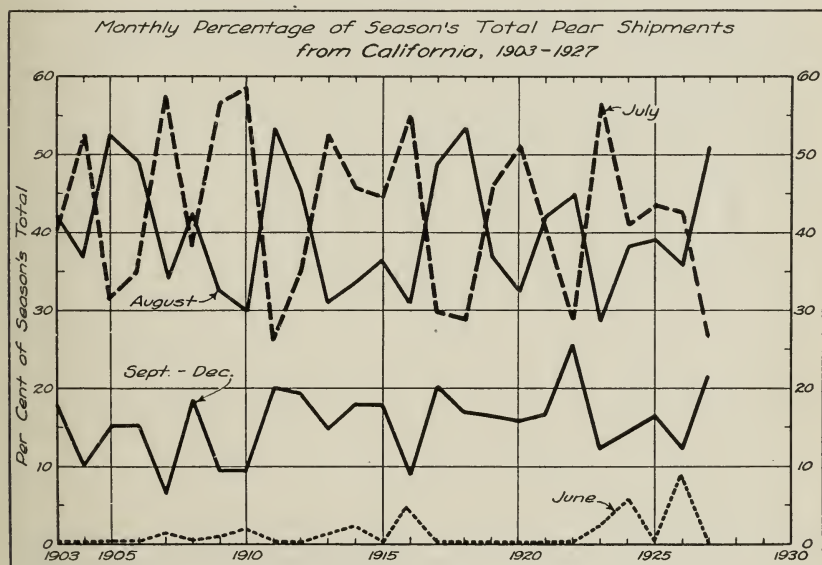


Fig. 15.—In years when California's pear crop is early July shipments constitute a larger percentage of the season's total than August shipments. Conversely, August shipments are larger than those of July in late-maturing seasons. (Data from table 13.)

Shipments for the remainder of the season, after August, have amounted to between ten and eleven hundred cars in recent years, or nearly 2.5 times the pre-war average. The September movement has accounted for about 750 carloads, October approximately 250, and the balance of the shipping season to June first less than 50 cars.

The most outstanding fact shown in figure 15 is the inverse relationship between the percentages of California pear shipments rolling in July and in August. In years when the California pear crop is early, shipments in July constitute a larger percentage of the season's total than those in August. On the other hand, in years in which there are very few early shipments, as in 1927, a considerably larger percentage of shipments to the East roll in August than in July.

TABLE 14

MONTHLY CARLOT SHIPMENTS OF CALIFORNIA PEARS BY COUNTIES AND DISTRICTS,  
1926

(Total of inter and intra-state, including carlot shipments of cannery pears.)

| County and district                     | June<br>cars | July<br>cars | Aug.<br>cars | Sept.<br>cars | Oct.<br>cars | Nov.<br>cars | Dec.<br>cars | Total<br>cars |
|-----------------------------------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|---------------|
| <i>Coast district: total</i> .....      | —            | 1,386        | 1,776        | 571           | 202          | 72           | 14           | 4,021         |
| Santa Clara.....                        | —            | 533          | 379          | 257           | 72           | 61           | 12           | 1,364         |
| Mendocino.....                          | —            | 211          | 1,165        | 74            | 15           | —            | —            | 1,465         |
| Sonoma.....                             | —            | 258          | 12           | 8             | 5            | —            | —            | 283           |
| Napa.....                               | —            | 210          | 6            | 151           | —            | —            | —            | 367           |
| San Benito.....                         | —            | 19           | 36           | 40            | 55           | 9            | —            | 159           |
| Monterey.....                           | —            | 18           | 47           | 20            | 36           | —            | —            | 121           |
| Santa Cruz.....                         | —            | 1            | 27           | 15            | 19           | 2            | 2            | 66            |
| Marin.....                              | —            | 20           | —            | —             | —            | —            | —            | 20            |
| Alameda.....                            | —            | 89           | 18           | 4             | —            | —            | —            | 111           |
| San Luis Obispo.....                    | —            | 27           | 86           | 2             | —            | —            | —            | 115           |
| <i>Sacramento Valley: total</i> .....   | 846          | 3,989        | 555          | 77            | 10           | —            | —            | 5,477         |
| Sacramento.....                         | 715          | 2,304        | 85           | 3             | 3            | —            | —            | 3,109         |
| Solano.....                             | 83           | 571          | 34           | —             | —            | —            | —            | 688           |
| Contra Costa.....                       | 2            | 446          | 91           | 16            | 1            | —            | —            | 487           |
| Yuba.....                               | 45           | 388          | 53           | 1             | —            | —            | —            | 556           |
| Yolo.....                               | 2            | 74           | 145          | 21            | —            | —            | —            | 242           |
| San Joaquin.....                        | —            | 54           | 81           | 10            | 1            | —            | —            | 146           |
| Glenn.....                              | —            | 31           | 18           | 12            | 5            | —            | —            | 66            |
| Shasta.....                             | —            | 6            | 8            | 4             | —            | —            | —            | 18            |
| Tehama.....                             | —            | 13           | 5            | 2             | —            | —            | —            | 20            |
| Sutter.....                             | —            | 10           | 26           | 8             | —            | —            | —            | 44            |
| Colusa.....                             | —            | 82           | 7            | —             | —            | —            | —            | 89            |
| Butte.....                              | —            | 10           | 2            | —             | —            | —            | —            | 12            |
| <i>Southern California: total</i> ..... | —            | —            | 102          | 32            | 15           | 26           | —            | 175           |
| Los Angeles.....                        | —            | —            | 3            | 14            | 14           | 26           | —            | 57            |
| Riverside.....                          | —            | —            | 22           | —             | 1            | —            | —            | 23            |
| Kern.....                               | —            | —            | 62           | 17            | —            | —            | —            | 79            |
| Inyo.....                               | —            | —            | 9            | 1             | —            | —            | —            | 10            |
| Santa Barbara.....                      | —            | —            | 5            | —             | —            | —            | —            | 5             |
| San Bernardino.....                     | —            | —            | 1            | —             | —            | —            | —            | 1             |
| <i>Mountain district: total</i> .....   | 6            | 463          | 1,384        | 268           | 12           | —            | —            | 2,135         |
| Placer.....                             | 6            | 422          | 793          | 97            | —            | —            | —            | 1,318         |
| Eldorado.....                           | —            | 43           | 587          | 170           | 12           | —            | —            | 812           |
| Tuolumne.....                           | —            | —            | 4            | 1             | —            | —            | —            | 5             |
| <i>Other counties: total</i> .....      | —            | 22           | 1            | —             | —            | —            | —            | 23            |
| <i>State total</i> .....                | 852          | 5,860        | 3,818        | 948           | 239          | 98           | 14           | 11,811        |
| Per cent of season's total              |              |              |              |               |              |              |              |               |
| State total—1926.....                   | 7.2          | 49.6         | 32.3         | 8.0           | 2.0          | 0.8          | 0.1          | 100           |
| 1925.....                               | 0.1          | 43.5         | 41.9         | 10.7          | 2.7          | 1.0          | 0.1          | 100           |
| Coast district—1926.....                | —            | 34.4         | 44.1         | 14.2          | 5.2          | 1.8          | 0.3          | 100           |
| 1925.....                               | —            | 16.5         | 46.9         | 26.4          | 8.7          | 1.1          | 0.4          | 100           |
| Sacramento Valley—1926.....             | 15.4         | 72.9         | 10.1         | 1.4           | 0.2          | —            | —            | 100           |
| 1925.....                               | 0.3          | 65.8         | 31.8         | 1.7           | 0.4          | —            | —            | 100           |
| Southern California—1926.....           | —            | —            | 58.3         | 18.3          | 8.6          | 14.8         | —            | 100           |
| 1925.....                               | —            | —            | 37.4         | 42.0          | 4.8          | 15.8         | —            | 100           |
| Mountain district—1926.....             | 0.3          | 21.7         | 64.8         | 12.6          | 0.6          | —            | —            | 100           |
| 1925.....                               | —            | 26.0         | 65.3         | 8.5           | 0.2          | —            | —            | 100           |
| Other counties—1926.....                | —            | 95.6         | 4.4          | —             | —            | —            | —            | 100           |
| 1925.....                               | —            | 41.9         | 54.8         | 3.3           | —            | —            | —            | 100           |

Source of data: Carlot shipments for 1926 from Hansen, C. J., and O. W. Holmes. Marketing California Pears, 1926. U. S. Bur. Agr. Econ. mimeo. release p. 10-13. June, 1927. Percentages for 1926 are based on these data and for 1925 on similar data from Hansen, C. J., and O. W. Holmes. California Pear Deal, 1925. U. S. Bur. Agr. Econ. mimeo. release p. 20-23. 1926.

In recent years interstate shipments in the two months of July and August have averaged about 80 per cent of the annual total, July shipments averaging about 43 per cent in the last five years and those in August approximately 37 per cent. The proportion of August shipments has been smaller than that of July shipments in every year from 1919 through 1926. However, the 1927 pear crop of the state was so late in maturing that August shipments were again equal to at least half of the shipments from the state, as they were in 1918.

The percentage of pears shipped from California in July has actually been somewhat decreased by substantial shipments in June in a few recent years in which an abnormally large percentage of the crop matured very early. In seven of the last ten years the percentage of June shipments from California north of Tehachapi has been only a fraction of one per cent. In two of the last four years, however, shipments during this month have averaged over 5 per cent of the state total, in 1926 rising to 8.7 per cent, the highest percentage of the California crop ever shipped in this month. The frequency with which a substantial proportion of the crop has matured in June in the last five years suggests that possibly there is an actual trend in this direction.

The percentage of the California shipments moving from the state after August has averaged about 15 per cent of the total in recent years and seems to have shown no particular tendency either to increase or to decrease. The proportion shipped in September has amounted to about 9 per cent, that in October to less than 4, and that in December to only a little over 1 per cent. In every month from January through May, California has usually shipped a few cars of cold-storage pears to eastern markets in recent years, as reference to table 12, page 50, discloses. The bulk of shipments during the winter and spring months, however, originate in the Pacific Northwest.

*California Monthly Shipments by Counties and Districts.*—A study of table 14 shows that in 1926 the bulk of the pear shipments moving from California in June and July originated in the Sacramento Valley and adjacent pear-growing areas in San Joaquin and Contra Costa counties, while the coast and mountain districts dominated the months of August and September. The relative seasonal variation in pear shipments from the state in 1926, as in 1924 and 1925, is probably somewhat typical of early shipping seasons. (See table 13, page 54, and figure 15, page 55.) In later-maturing seasons there is a tendency for a larger percentage of pears from the Sacramento Valley to be shipped in August, and a smaller percentage of those from the coast and mountain districts. Practically all of the

small volume of pear shipments from southern California move after July, a larger percentage of the total from this section moving in September, October, and November than from any other district in California.

The chief counties which shipped a majority of their crop by the end of July in 1926, arranged according to carlots shipped up to this date, are Sacramento, Solano, Contra Costa, Yuba, Sonoma, and Napa. A similar list of important shipping counties, the majority of shipments from which moved in August or later in 1926, are Santa Clara, Mendocino, Lake, Placer, and Eldorado. The relative lateness of shipments from these counties is accounted for largely by climatic conditions, which are less conducive to early maturity than are those in the hot interior, and also because a smaller proportion of Bartletts and a correspondingly larger proportion of fall and winter varieties of pears are grown in these coast and mountain counties than in the interior valleys.

*Monthly Cold-Storage Movement of Pears.*<sup>41</sup>—Data on the quantity of pears held in cold storage in the United States on the first of each month are available only since 1923. These data are exhibited in table 15 and are pictured in figure 16 for three years separately, showing not only the total holdings, but likewise the relative amounts of pears stored in boxes and in barrels.

Pears move into cold storage in large amounts from July to about the middle of October or infrequently up to the first of November, a period of something over three months, most of the movement occurring in August and September. The reports indicate that an average of probably 1.2 million bushels of pears a year moved into cold storage

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<sup>41</sup> Important technical problems involved in the handling, shipping, and cold storage of Pacific Coast pears are discussed in the following publications:

Overholser, E. L., and L. P. Latimer. The cold storage of pears. California Agr. Exp. Sta. Bul. 377: 1-56. 1924.

Hartman, H. Studies relating to the harvesting and storage of apples and pears. Oregon Agr. Exp. Sta. Bul. 206: 1-32. 1924.

Hartman, H., J. R. Magness, F. C. Reimer, and M. H. Haller. Investigations on the harvesting and handling of Bosc pears from the Rogue River Valley. Oregon Agr. Exp. Sta. Bul. 228: 1-30. 1927.

Magness, J. R. The handling, shipping, and cold storage of Bartlett pears in the Pacific Coast states. U. S. Dept. Agr. Bul. 1072: 1-16. 1922.

Magness, J. R. The relation of growing conditions, maturity when picked, and temperature to the ripening of Bartlett pears. Oregon State Hort. Soc. 17th Annual Report: 166-169. 1926.

See also the bibliography by Bercaw, L. O. Refrigeration and cold storage. U. S. Dept. Agr. Library, Bibliographical Contribution 10: 1-58 (mimeo.) 1925.

in the three years 1924-1926, or over 5 per cent of national production and approximately 11 per cent of total earlot shipments during the same period.

No substantial movement out of cold storage begins until about the middle of October or the first of November, depending upon the existing situation in regard to shipments in any particular season. The heaviest movement of storage stock into consumption takes place in

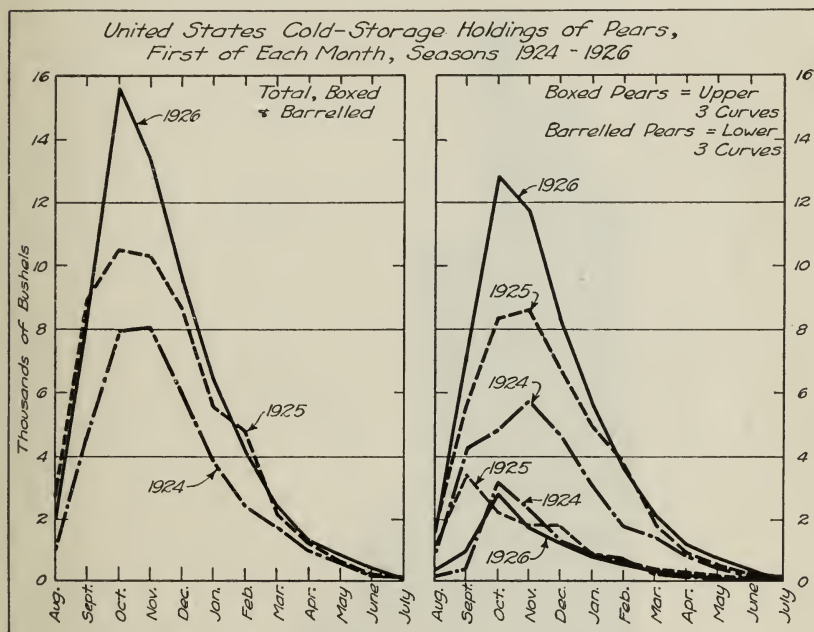


Fig. 16.—Pears move into cold storage in large amounts from July to about the middle of October. The heaviest outward movement takes place in the months of November through February.

(Data from table 15.)

the four months of November through February, this movement amounting to about 70 per cent of the total in recent years. The heaviest withdrawals occur in November or December, varying somewhat in different years. Most of the cold-storage pears are exhausted by the last of March, although a few last over until June.

Indications are that cold storage is being used more extensively than formerly as a means of holding both Bartletts and late varieties off the market when it seems that prices will probably be better later in the season. This practice was noticeable during the 1926 season.

“Rather than ship their pears to the markets [in 1926] and take an almost certain loss,” Hansen and Holmes state, “many shippers and growers taxed their storage facilities to extremes in an endeavor to spread the shipments over as long a period as possible. This probably improved the situation to some extent and especially proved a boon

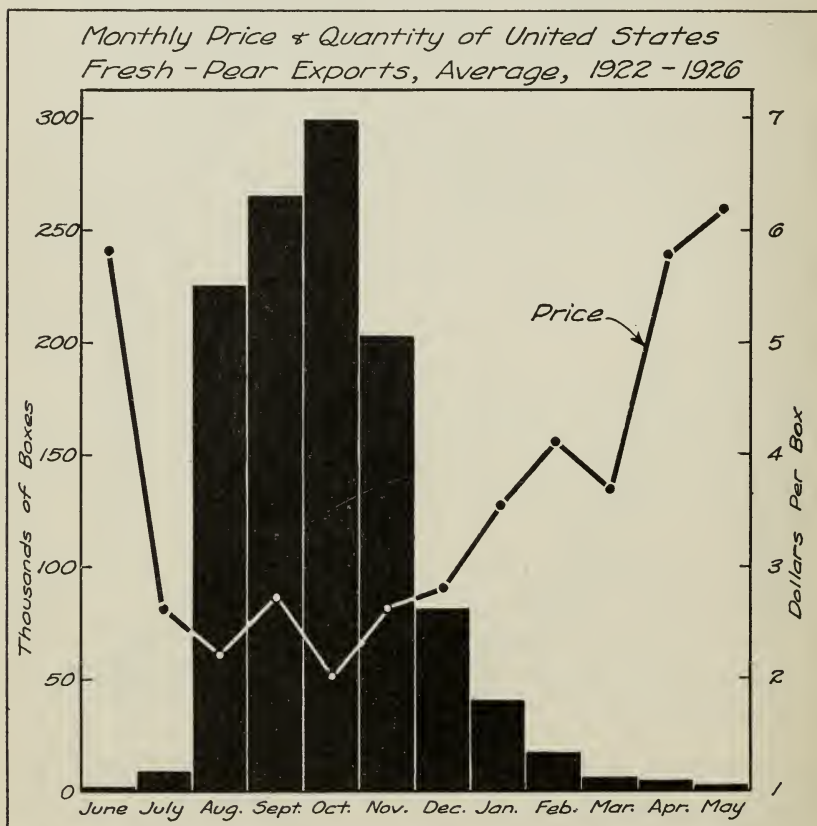


Fig. 17.—Fresh pears are exported chiefly during the six months of August through January, the peak coming in October. Prices generally rise rapidly during the winter and spring months when available supplies are small.  
(Data from table 16.)

to the holders of late fall varieties, for some were sold during the later months at fairly attractive prices. In most sections of the west the larger growers, or packers, are equipping their establishments with cold-storage plants. It has been found, in many instances, that storing at point of origin was as satisfactory as storing at terminal markets. This was especially true where operators were compelled to hold their products awaiting favorable marketing conditions. It

gave them the advantage of making personal inspections as to the keeping quality and placed them in position of more easily handling their sales. However, in cases where the quality deteriorated rapidly it made long shipment and successful marketing precarious. Eastern

TABLE 15

UNITED STATES COLD-STORAGE HOLDINGS OF PEARS ON FIRST OF EACH MONTH,  
SEASONS 1923-1926

(In thousands of bushels, i.e., 000 omitted.)

| Crop year            | August 1    |             |            | September 1 |             |            | October 1   |             |              | November 1  |             |              |
|----------------------|-------------|-------------|------------|-------------|-------------|------------|-------------|-------------|--------------|-------------|-------------|--------------|
|                      | In<br>bbls. | In<br>boxes | To-<br>tal | In<br>bbls. | In<br>boxes | To-<br>tal | In<br>bbls. | In<br>boxes | Total        | In<br>bbls. | In<br>boxes | Total        |
| 1923-24.....         |             |             |            | 111         | 408         | 519        | 192         | 501         | 693          | 126         | 790         | 916          |
| 1924-25.....         | 12          | 91          | 103        | 36          | 425         | 461        | 309         | 489         | 798          | 231         | 576         | 807          |
| 1925-26.....         | 108         | 162         | 270        | 345         | 551         | 896        | 219         | 832         | 1,051        | 177         | 862         | 1,039        |
| 1926-27.....         | 42          | 159         | 201        | 99          | 719         | 818        | 276         | 1,285       | 1,561        | 171         | 1,171       | 1,342        |
| <i>Average</i> ..... | <i>54</i>   | <i>137</i>  | <i>191</i> | <i>148</i>  | <i>526</i>  | <i>674</i> | <i>249</i>  | <i>777</i>  | <i>1,026</i> | <i>176</i>  | <i>850</i>  | <i>1,026</i> |

| Crop year            | December 1  |             |            | January 1   |             |            | February 1  |             |            | March 1     |             |            |
|----------------------|-------------|-------------|------------|-------------|-------------|------------|-------------|-------------|------------|-------------|-------------|------------|
|                      | In<br>bbls. | In<br>boxes | To-<br>tal | In<br>bbls. | In<br>boxes | To-<br>tal | In<br>bbls. | In<br>boxes | Total      | In<br>bbls. | In<br>boxes | Total      |
| 1923-24.....         | 93          | 606         | 699        | 69          | 389         | 458        | 42          | 218         | 260        | 21          | 134         | 155        |
| 1924-25.....         | 132         | 468         | 600        | 87          | 301         | 388        | 63          | 182         | 245        | 27          | 149         | 176        |
| 1925-26.....         | 186         | 679         | 865        | 87          | 490         | 577        | 57          | 381         | 438        | 39          | 177         | 216        |
| 1926-27.....         | 123         | 834         | 957        | 78          | 569         | 647        | 51          | 360         | 411        | 30          | 215         | 245        |
| <i>Average</i> ..... | <i>134</i>  | <i>647</i>  | <i>780</i> | <i>80</i>   | <i>437</i>  | <i>518</i> | <i>53</i>   | <i>285</i>  | <i>339</i> | <i>29</i>   | <i>169</i>  | <i>198</i> |

| Crop year            | April 1     |             |            | May 1       |             |            | June 1      |             |           | July 1      |             |            |
|----------------------|-------------|-------------|------------|-------------|-------------|------------|-------------|-------------|-----------|-------------|-------------|------------|
|                      | In<br>bbls. | In<br>boxes | To-<br>tal | In<br>bbls. | In<br>boxes | To-<br>tal | In<br>bbls. | In<br>boxes | Total     | In<br>bbls. | In<br>boxes | Total      |
| 1923-24.....         | 9           | 75          | 84         | 6           | 28          | 34         | 0           | 9           | 9         | ?           | 5           | 5?         |
| 1924-25.....         | 12          | 87          | 99         | 9           | 46          | 55         | 0           | 18          | 18        | 0           | 8           | 8          |
| 1925-26.....         | 27          | 97          | 124        | 12          | 52          | 64         | 6           | 16          | 22        | 6           | 7           | 13         |
| 1926-27.....         | 18          | 120         | 138        | 9           | 75          | 84         | 3           | 42          | 45        | 3           | 24          | 27         |
| <i>Average</i> ..... | <i>17</i>   | <i>96</i>   | <i>111</i> | <i>9</i>    | <i>50</i>   | <i>59</i>  | <i>2</i>    | <i>21</i>   | <i>23</i> | <i>3?</i>   | <i>11</i>   | <i>14?</i> |

Source of data: Compiled from the latest revisions given in Crops and Markets and its Monthly Supplement.

storages were reported filled to capacity and receipts were forced on the markets, often encountering a glutted condition. With the prospects of increased productions it is quite essential that additional storage or pre-cooling plants be provided."<sup>42</sup>

*Monthly Exports of Fresh Pears.*—The average monthly movement of pears from the United States into foreign markets and the

<sup>42</sup> Hansen, Carl J., and O. W. Holmes. Marketing California pears, 1926. U. S. Dept. Agr., Bur. Agr. Econ., pp. 1, 2 (mimeo.). June, 1927.

weighted-average export valuation per box of 46 pounds net weight are pictured in figure 17. Approximately 95 per cent of our exports move from the United States during the six months from July to December inclusive. The peak of shipments abroad occurs during October, which has accounted for about 26 per cent of the export movement of fresh pears in the last five years. Over two-thirds of the movement has occurred in the three months of August, September, and October. The rapid increase in exports from July to October, followed by a less rapid decline is shown in figure 17. Some fresh pears are exported every month in the year.

TABLE 16

UNITED STATES MONTHLY EXPORTS OF FRESH PEARS, QUANTITY AND VALUE,  
AVERAGE, SEASONS 1922-1926

| Month                 | Quantity   |           |                   | Export valuation |         |
|-----------------------|------------|-----------|-------------------|------------------|---------|
|                       | Pounds     | Boxes     | Per cent of total | Per pound        | Per box |
|                       | 1          | 2         | 3                 | 4                | 5       |
| June.....             | 73,086     | 1,589     | 0.1               | \$0.127          | \$5.84  |
| July.....             | 3,672,693  | 7,984     | 0.7               | .057             | 2.62    |
| August.....           | 10,394,910 | 225,976   | 19.5              | .048             | 2.21    |
| September.....        | 12,187,261 | 264,940   | 22.9              | .059             | 2.72    |
| October.....          | 13,729,324 | 298,464   | 25.8              | .044             | 2.02    |
| November.....         | 9,505,701  | 206,646   | 17.8              | .053             | 2.64    |
| December.....         | 3,810,020  | 82,827    | 7.4               | .061             | 2.81    |
| January.....          | 1,825,317  | 39,681    | 3.4               | .077             | 3.54    |
| February.....         | 752,310    | 16,355    | 1.4               | .090             | 4.15    |
| March.....            | 303,040    | 6,588     | 0.6               | .080             | 3.68    |
| April.....            | 175,836    | 3,823     | 0.3               | .126             | 5.79    |
| May.....              | 77,474     | 1,684     | 0.1               | .135             | 6.19    |
| Seasonal average..... | 56,506,972 | 1,156,557 | 100.0             | \$0.050          | \$2.32  |

Sources of data:

Col. 1.—Approximate net weight of fresh-pear exports, excluding package. Compiled from Monthly Summary of Foreign Commerce.

Col. 2.—Data in col. 1 converted to boxes on basis of 46 pounds net per box.

Col. 4.—Simple average of monthly weighted-average export valuation per pound based on data from Monthly Summary of Foreign Commerce.

Col. 5.—Data in col. 4 converted to a box basis at the rate of 46 pounds net per box.

*Monthly Export Prices of Fresh Pears.*—A study of the curve of average monthly prices shown in figure 17, page 61, shows that normally exported pears are sold at the highest price during the month of May and at the lowest in October or August. There seems to be a tendency for the September price to rise slightly above the August price. From October to May, prices usually rise steadily with an occasional slight temporary decline.

COMPETITION OF OTHER FRUITS WITH CALIFORNIA BARTLETTS<sup>45</sup>

*Competition Keenest in July and August.*—During July and August, California normally ships between 80 and 85 per cent of its annual interstate shipments of pears. Since only a small proportion of these shipments go into storage, the large majority move into consumption in competition with numerous other kinds of fresh fruits, which are shipped in abundance during the summer months. Figure 18 shows for each of these two months the average number of carloads of each of the chief kinds of fresh-fruit shipments originating in the United States in the three years 1924–1926, and in the period 1919–1921. A comparison of the total length of the bars shows the relative volume of supplies of the chief fruits which California pears have met in the last three years. A comparison of the black portion of each bar, which shows the average shipments in the three years 1919–1921, with the cross-hatched portion enables one to visualize the average increase which has taken place for every fruit included except cantaloupes, in a period of five years. Both pear and peach shipments as shown in figure 18 are somewhat larger than the amount actually moved into fresh consumption, for the reason that some of these shipments normally go to canneries. The data as shown, however, give one a reasonably accurate picture of the competing supply of the chief fresh fruits moving to market during July and August.

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<sup>45</sup> Some light on the competition between the chief kinds of fruit produced in the United States may be gained by a study of other bulletins in this series which the College of Agriculture is issuing on major economic aspects of California's more important fruits. Bulletins of this kind are now available on peaches, apricots, cantaloupes, grapes, apples, and watermelons, and studies of other fruits are under way. Competition of our chief fruits is specifically but briefly discussed in the following:

Rauchenstein, E. Economic aspects of the cantaloupe industry. California Agr. Exp. Sta. Bul. 419: 17–19. 1927.

——— Economic aspects of the apple industry. California Agr. Exp. Sta. Bul. 445: 27–29. 1927.

——— Economic aspects of the watermelon industry. California Agr. Exp. Sta. Bul. 449: 17–22. 1928.

Shear, S. W., and H. F. Gould. Economic status of the grape industry. California Agr. Exp. Sta. Bul. 429: 5, 42, 43, 56, 96. 1927.

Wellman, H. R. Apricots. California Agr. Exp. Sta. Bul. 423: 8, 20, 26. 1927.

For the carlot movement of the chief kinds of fresh fruits in the United States during June and July, 1918–1926, see Cooper, M. R., and J. W. Park. The peach situation in the southern states. U. S. Dept. Agr., Dept. Cir. 420: 16, 17. 1927.

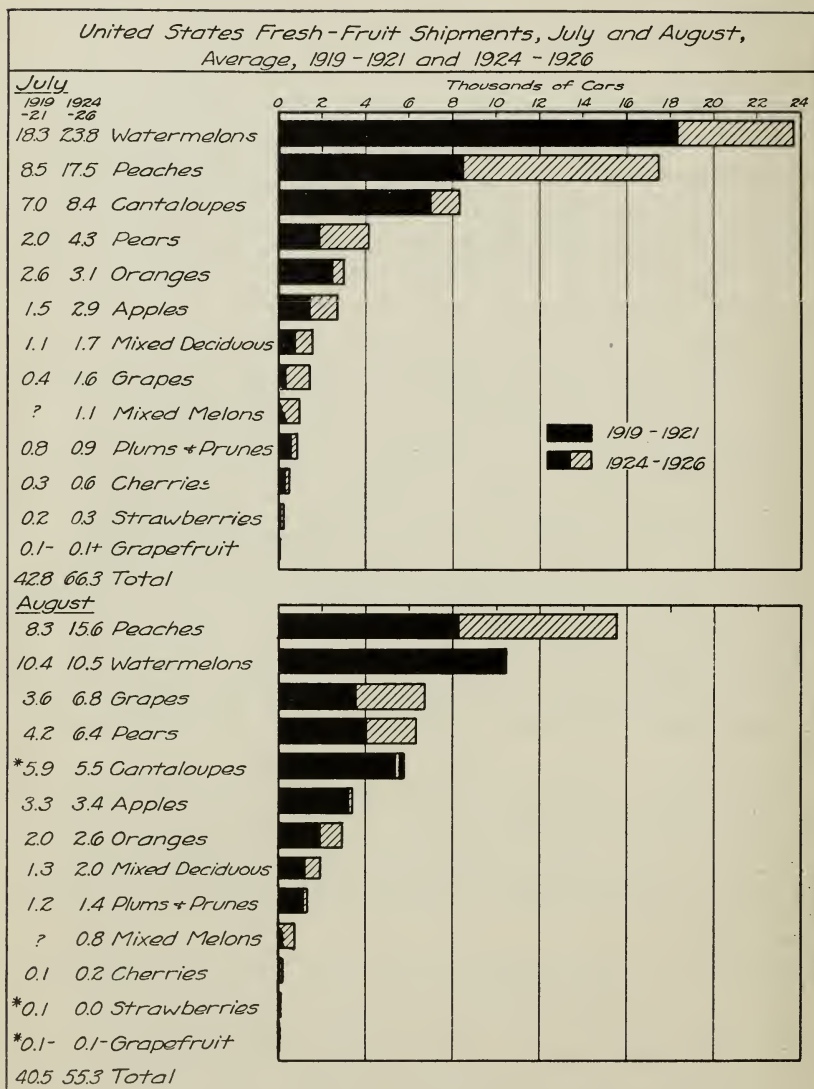


Fig. 18.—Heavy pear shipments from California in July and August meet the greatest competition from watermelons, peaches, cantaloupes, and grapes, shipments of which have increased greatly in the last five years.

(\* The asterisk indicates a slight decline in shipments of the fruits so marked. Data from table 17.)

In the three years 1924-1926 pears constituted less than 10 per cent of the national shipments of all fruits during July and August. The total lengths of the bars show that watermelons, peaches, and cantaloupes are the most abundant mid-summer fruits. In recent years more than twice as many carloads of both fresh peaches and watermelons as of pears have been shipped during July and August. Cantaloupe shipments have also somewhat exceeded those of pears during these two months. Pears likewise competed with an average of 5,000 to 10,000 carloads each of grapes, apples, and oranges, and over 9,000 carloads of other fruits named in figure 18, chiefly plums, mixed melons, cherries, and strawberries, besides many berries such as blackberries, raspberries, and loganberries for which shipments are not given.

TABLE 17

UNITED STATES CARLOT SHIPMENTS OF CHIEF FRESH FRUITS, AVERAGE 1919-1921 AND 1924-1926; JULY, AUGUST, JULY-AUGUST, AND CALENDAR YEAR TOTALS

| Kind of fruit         | July            |                 | August          |                 | July-August total |                 | Calendar year |                                   |                 |
|-----------------------|-----------------|-----------------|-----------------|-----------------|-------------------|-----------------|---------------|-----------------------------------|-----------------|
|                       | 1924-26<br>cars | 1919-21<br>cars | 1924-26<br>cars | 1919-21<br>cars | 1924-26<br>cars   | 1919-21<br>cars | 1924-26       |                                   | 1919-21<br>cars |
|                       |                 |                 |                 |                 |                   |                 | Cars          | Per cent<br>of 1919-21<br>average |                 |
| Watermelons.....      | 23,779          | 18,349          | 10,497          | 10,470          | 34,276            | 28,819          | 47,523        | 119                               | 39,974          |
| Peaches.....          | 17,516          | 8,495           | 15,636          | 8,295           | 33,152            | 16,790          | 45,825        | 159                               | 28,812          |
| Cantaloupes.....      | 8,378           | 7,032           | 5,499           | 5,869           | 13,877            | 12,901          | 28,762        | 122                               | 23,602          |
| Pears.....            | 4,265           | 1,961           | 6,375           | 4,160           | 10,640            | 6,121           | 20,508        | 157                               | 13,079          |
| Grapes.....           | 1,584           | 417             | 6,807           | 3,620           | 8,391             | 4,037           | 76,456        | 210                               | 36,491          |
| Apples.....           | 2,898           | 1,475           | 3,405           | 3,319           | 6,303             | 4,794           | 119,593       | 124                               | 96,274          |
| Oranges.....          | 3,103           | 2,640           | 2,546           | 2,041           | 5,649             | 4,681           | 67,180        | 121                               | 55,426          |
| Mixed deciduous.....  | 1,722           | 1,115           | 2,000           | 1,295           | 3,722             | 2,409           | 6,401         | 153                               | 4,111           |
| Plums and prunes..... | 921             | 771             | 1,425           | 1,206           | 2,346             | 1,986           | 5,509         | 118                               | 4,663           |
| Misc. melons.....     | 1,063           |                 | 831             |                 | 1,894             |                 | 4,068         |                                   |                 |
| Cherries.....         | 595             | 337             | 238             | 135             | 833               | 473             | 2,497         | 177                               | 1,415           |
| Strawberries.....     | 346             | 193             |                 | 275             | 346               | 268             | 14,842        | 170                               | 8,723           |
| Grapefruit.....       | 122             | 37              | 37              | 36              | 159               | 97              | 18,301        | 181                               | 10,101          |
| Total.....            | 66,292          | 42,822          | 55,296          | 40,521          | 121,588           | 83,376          | 470,370       | 141                               | 332,814         |

Sources of data:

*Data for calendar year 1919:* cherries, plums and prunes from Market Reporter 3: 73. Jan. 29, 1921, mixed deciduous (crop year) from Weather, Crops and Markets 3: 43. Jan. 20, 1923, grapefruit, lemons, and oranges (tangerines are not included in 1919 data) from U. S. Dept. Agr. Yearbook 1923: 740, all other fruits from U. S. Dept. Agr. Yearbook 1923: 787-788. Calendar years 1920-1921 mixed deciduous from Weather, Crops and Markets 3: 43. Jan. 20, 1923, all other fruits from U. S. Dept. Agr. Stat. Bul. 8: 2. 1925. Calendar years 1924-1925 from U. S. Dept. Agr. Stat. Bul. 19: 2. Calendar year 1926 compiled from monthly summary of carlot shipments in Crops and Markets, Monthly Supplements during 1926-27, and are cumulative totals for season to end of December.

*Monthly data.* Oranges and grapefruit for 1919-1920 from Market Statistics, U. S. Dept. Agr. Bul. 982: 231. 1921; for 1921 compiled from issues of Weather, Crops and Markets for 1922. Mixed deciduous, plums and prunes, and cherries, for 1919-1921 compiled from Weather, Crops and Markets. All other fruit 1919-1921 from U. S. Dept. Agr. Yearbook 1923: 787-788. All fruits for 1924-1926 compiled from issues of Crops and Markets or its Monthly Supplements for 1925, 1926, and 1927.

TABLE 18  
WEEKLY UNITED STATES PEAR SHIPMENTS BY CHIEF STATES AND GROUPS,  
SEASONS 1925-1927

| Week ending  | U. S.<br>total | Washington-<br>Oregon<br>total |      | California  |      |                       |      |                      |      |                       |    |
|--------------|----------------|--------------------------------|------|-------------|------|-----------------------|------|----------------------|------|-----------------------|----|
|              |                |                                |      | Total       |      | Northern<br>district* |      | Central<br>district* |      | Southern<br>district* |    |
|              |                |                                |      |             |      |                       |      |                      |      |                       |    |
| Cars         | Cars           | Per<br>cent                    | Cars | Per<br>cent | Cars | Per<br>cent           | Cars | Per<br>cent          | Cars | Per<br>cent           |    |
| 1925         |                |                                |      |             |      |                       |      |                      |      |                       |    |
| June 20..... | 1              | 0                              | 0    | 1           | 100  | 1                     | 100  | 0                    | 0    | 0                     | 0  |
| 27.....      | 0              | 0                              | 0    | 0           | 0    | 0                     | 0    | 0                    | 0    | 0                     | 0  |
| July 4.....  | 94             | 0                              | 0    | 93          | 99   | 93                    | 99   | 0                    | 0    | 0                     | 0  |
| 11.....      | 551            | 0                              | 0    | 541         | 98   | 539                   | 98   | 2                    | 0    | 0                     | 0  |
| 18.....      | 926            | 0                              | 0    | 896         | 97   | 865                   | 93   | 31                   | 4    | 0                     | 0  |
| 25.....      | 1,139          | 0                              | 0    | 1,104       | 97   | 1,002                 | 88   | 102                  | 9    | 0                     | 0  |
| Aug. 1.....  | 1,499          | 49                             | 3    | 1,386       | 93   | 1,103                 | 74   | 283                  | 19   | 0                     | 0  |
| 8.....       | 1,576          | 245                            | 16   | 1,206       | 76   | 980                   | 62   | 226                  | 14   | 0                     | 0  |
| 15.....      | 1,572          | 517                            | 33   | 828         | 52   | 692                   | 44   | 123                  | 8    | 13                    | 0  |
| 22.....      | 1,606          | 488                            | 30   | 789         | 49   | 618                   | 39   | 145                  | 9    | 26                    | 1  |
| 29.....      | 1,545          | 467                            | 30   | 470         | 30   | 348                   | 23   | 111                  | 7    | 11                    | 0  |
| Sept. 5..... | 1,764          | 589                            | 33   | 354         | 20   | 222                   | 13   | 118                  | 6    | 14                    | 1  |
| 12.....      | 1,728          | 697                            | 40   | 230         | 13   | 97                    | 6    | 116                  | 6    | 17                    | 1  |
| 19.....      | 1,621          | 639                            | 39   | 199         | 12   | 54                    | 3    | 127                  | 7    | 18                    | 2  |
| 26.....      | 1,267          | 463                            | 37   | 186         | 14   | 31                    | 2    | 135                  | 10   | 20                    | 2  |
| Oct. 3.....  | 1,062          | 348                            | 33   | 120         | 11   | 15                    | 1    | 104                  | 10   | 1                     | 0  |
| 10.....      | 978            | 280                            | 29   | 80          | 8    | 8                     | 1    | 72                   | 7    | 0                     | 0  |
| 17.....      | 706            | 204                            | 29   | 56          | 8    | 4                     | 1    | 50                   | 7    | 2                     | 0  |
| 24.....      | 414            | 113                            | 27   | 38          | 9    | 1                     | 0    | 34                   | 8    | 3                     | 1  |
| 31.....      | 198            | 57                             | 29   | 18          | 9    | 1                     | 0    | 14                   | 7    | 3                     | 2  |
| Nov. 7.....  | 150            | 90                             | 60   | 10          | 7    | 0                     | 0    | 8                    | 6    | 2                     | 1  |
| 14.....      | 129            | 79                             | 61   | 13          | 10   | 0                     | 0    | 9                    | 7    | 4                     | 3  |
| 21.....      | 77             | 37                             | 48   | 5           | 7    | 0                     | 0    | 2                    | 3    | 3                     | 4  |
| 28.....      | 39             | 20                             | 51   | 11          | 28   | 0                     | 0    | 7                    | 18   | 4                     | 10 |
| 1926†        |                |                                |      |             |      |                       |      |                      |      |                       |    |
| June 19..... | 53             | 0                              | 0    | 53          | 100  | 53                    | 100  | 0                    | 0    | 0                     | 0  |
| 26.....      | 394            | 0                              | 0    | 394         | 100  | 394                   | 100  | 0                    | 0    | 0                     | 0  |
| July 3.....  | 883            | 0                              | 0    | 883         | 100  | 877                   | 99   | 6                    | 1    | 0                     | 0  |
| 10.....      | 1,165          | 3                              | 0    | 1,162       | 100  | 1,100                 | 94   | 62                   | 6    | 0                     | 0  |
| 17.....      | 1,607          | 22                             | 1    | 1,580       | 99   | 1,216                 | 76   | 364                  | 23   | 0                     | 0  |
| 24.....      | 1,513          | 81                             | 5    | 1,427       | 94   | 999                   | 66   | 428                  | 28   | 0                     | 0  |
| 31.....      | 1,480          | 297                            | 20   | 1,175       | 79   | 975                   | 66   | 200                  | 13   | 0                     | 0  |
| Aug. 7.....  | 1,849          | 624                            | 34   | 1,156       | 62   | 994                   | 54   | 162                  | 8    | 0                     | 0  |
| 14.....      | 1,964          | 697                            | 36   | 1,083       | 55   | 952                   | 49   | 128                  | 6    | 3                     | 0  |
| 21.....      | 1,754          | 792                            | 45   | 839         | 48   | 671                   | 39   | 164                  | 9    | 4                     | 0  |
| 28.....      | 1,528          | 727                            | 48   | 544         | 35   | 418                   | 27   | 119                  | 8    | 7                     | 0  |
| Sept. 4..... | 1,565          | 909                            | 58   | 352         | 22   | 247                   | 16   | 102                  | 6    | 3                     | 0  |
| 11.....      | 1,579          | 913                            | 58   | 230         | 15   | 140                   | 9    | 90                   | 6    | 0                     | 0  |
| 18.....      | 1,711          | 765                            | 45   | 170         | 10   | 68                    | 4    | 97                   | 6    | 5                     | 0  |
| 25.....      | 1,218          | 432                            | 35   | 153         | 13   | 43                    | 4    | 105                  | 9    | 5                     | 0  |
| Oct. 2.....  | 820            | 340                            | 41   | 88          | 11   | 18                    | 2    | 65                   | 8    | 5                     | 1  |
| 9.....       | 857            | 204                            | 24   | 88          | 10   | 21                    | 2    | 58                   | 7    | 9                     | 1  |
| 16.....      | 774            | 169                            | 22   | 60          | 8    | 8                     | 1    | 45                   | 6    | 7                     | 1  |
| 23.....      | 578            | 128                            | 22   | 48          | 8    | 2                     | 0    | 38                   | 7    | 8                     | 1  |
| 30.....      | 401            | 93                             | 23   | 38          | 9    | 0                     | 0    | 26                   | 6    | 12                    | 3  |
| Nov. 6.....  | 247            | 97                             | 39   | 33          | 13   | 0                     | 0    | 26                   | 10   | 7                     | 3  |
| 13.....      | 168            | 77                             | 46   | 31          | 18   | 0                     | 0    | 20                   | 12   | 11                    | 6  |
| 20.....      | 117            | 70                             | 60   | 18          | 15   | 0                     | 0    | 11                   | 9    | 7                     | 6  |
| 27.....      | 81             | 56                             | 69   | 9           | 11   | 0                     | 0    | 9                    | 11   | 0                     | 0  |
| 1927†        |                |                                |      |             |      |                       |      |                      |      |                       |    |
| July 9.....  | 66             | 0                              | 0    | 59          | 86   | 59                    | 86   | 0                    | 0    | 0                     | 0  |
| 16.....      | 422            | 0                              | 0    | 405         | 96   | 405                   | 96   | 0                    | 0    | 0                     | 0  |
| 23.....      | 695            | 0                              | 0    | 655         | 94   | 654                   | 94   | 1                    | 0    | 0                     | 0  |
| 30.....      | 1,029          | 0                              | 0    | 979         | 95   | 961                   | 93   | 18                   | 2    | 0                     | 0  |
| Aug. 6.....  | 1,185          | 2                              | 0    | 1,109       | 94   | 975                   | 83   | 134                  | 11   | 0                     | 0  |
| 13.....      | 1,586          | 48                             | 3    | 1,366       | 86   | 1,019                 | 64   | 345                  | 22   | 2                     | 0  |
| 20.....      | 1,819          | 289                            | 16   | 1,286       | 70   | 930                   | 51   | 352                  | 19   | 4                     | 0  |
| 27.....      | 1,747          | 524                            | 30   | 941         | 54   | 729                   | 42   | 210                  | 12   | 2                     | 0  |
| Sept. 3..... | 1,262          | 430                            | 34   | 570         | 45   | 460                   | 36   | 107                  | 9    | 3                     | 0  |
| 10.....      | 1,325          | 502                            | 38   | 542         | 41   | 447                   | 34   | 93                   | 7    | 2                     | 0  |
| 17.....      | 1,391          | 705                            | 51   | 395         | 28   | 294                   | 21   | 99                   | 7    | 2                     | 0  |
| 24.....      | 1,363          | 784                            | 57   | 154         | 12   | 76                    | 6    | 76                   | 6    | 2                     | 0  |
| Oct. 1.....  | 1,065          | 592                            | 55   | 105         | 10   | 25                    | 2    | 75                   | 7    | 5                     | 1  |
| 8.....       | 797            | 329                            | 41   | 88          | 11   | 28                    | 4    | 56                   | 7    | 4                     | 0  |
| 15.....      | 614            | 233                            | 38   | 74          | 12   | 7                     | 1    | 64                   | 10   | 3                     | 1  |
| 22.....      | 401            | 113                            | 28   | 60          | 15   | 13                    | 3    | 47                   | 12   | 0                     | 0  |
| 29.....      | 284            | 77                             | 27   | 38          | 13   | .....                 | 0    | 32                   | 11   | 6                     | 2  |
| Nov. 5.....  | 208            | 89                             | 43   | 27          | 13   | .....                 | 0    | 22                   | 11   | 5                     | 2  |
| 12.....      | 142            | 49                             | 35   | 35          | 25   | .....                 | 0    | 27                   | 19   | 8                     | 6  |
| 19.....      | 117            | 59                             | 50   | 23          | 20   | .....                 | 0    | 14                   | 12   | 9                     | 8  |
| 26.....      | 69             | 38                             | 55   | 14          | 20   | .....                 | 0    | 12                   | 17   | 2                     | 3  |

† Data for 1926 and 1927 are preliminary and subject to revision.

\* The California districts correspond to those demarcated on the map of California shown in figure 5, page 30, except that data for the southern district in this table include shipments from Imperial Valley.

Source of data: Data compiled from 1926 and 1927 issues of Weekly Summary of Carlot Shipments of Fruits and Vegetables, a mimeographed weekly release of the U. S. Bureau of Agricultural Economics.

From 1920 to 1925, total fruit shipments during the two summer months of July and August increased on the average nearly 50 per cent. Shipments of peaches during these two months, largely because of the tremendous expansion of commercial production in Georgia, doubled from 1920 to 1925, normal shipments for the latter year being more than 16,000 carloads greater than in 1920. Summer-grape shipments likewise doubled in these five years, although increasing absolutely only about 4,300 carloads. Pear shipments during July and August likewise increased about 4,500 cars from 1920 to 1925, an increase of 75 per cent.

*Watermelons and Peaches are Chief Competitors.*—Heavier shipments of watermelons and peaches together occur in July and August than of all other fruits combined, including pears. July shipments of the two have averaged nearly 42,000 carloads in the last three years, representing approximately 62 per cent of shipments of domestic fresh fruits during the month. Comparable August shipments are about 26,100 carloads, or about 47 per cent of the fresh-fruit shipments originating in the United States in this month.

Watermelon shipments are much heavier in July than in August, whereas peach shipments have run about the same for the two months. Average shipments of watermelons for July show a marked increase since 1920, but scarcely any in August. The greatest increase in both of these months has, however, come about in peach shipments, which almost doubled in the five years from 1920 to 1925.

July shipments of cantaloupes, which are only about half those of peaches, take third place. In August, however, they rank as fifth only, being exceeded by pears and by the rapidly increasing shipments of grapes, which take third place in this month. Neither apples nor oranges are shipped in large quantities in July and August, although the total of the two is substantial. Shipments of the half-dozen other fruits pictured in figure 18 are individually small in both July and August, although as a total they are nearly as great as pear shipments in July and about two-thirds as great as pear shipments in August.

#### WEEKLY VARIATION IN SHIPMENTS

The rapid changes which take place within a few days in the supply and price of a perishable commodity like pears make it necessary to study the weekly variation in fresh shipments during the greater part of the shipping season. Weekly United States shipments of pears in 1925 and in 1926 from the earliest movement in June until the last week in November are pictured in figure 13, page 52. A

study of this chart and of table 18 shows the approximate amount of competition which California pears usually meet from shipments from the Pacific Northwest and from all states but the three on the Pacific Coast, at different times during the shipping season. The amount of competition which California pears meet in eastern markets from other important commercial pear-shipping areas, of course, varies appreciably from year to year, being determined largely by the relative earliness or lateness and hence the relative seasonal distribution of pears originating in this state, in the Pacific Northwest, and in New York.

*Movement from California Dominates the Early Market.*—California pears normally dominate the eastern market for the first five or six weeks of the shipping season. In both 1925 and 1926 over 90 per cent of the fresh-pear shipments in each of the first five weeks of the shipping season originated in California and not until the first week in August in 1926, and the second in 1925, did the state contribute less than three-fourths of the weekly movement of pears. As supplies from California decrease after reaching a peak sometime during the second month of the shipping season, and shipments from the Pacific northwest and then from the eastern states increase in number, the proportion which California pear shipments bear to the total rapidly declines after the early part of August until it amounts to only about 10 per cent during October.

*Pacific Northwest Follows California.*—About the time that the movement of California fresh pears reaches its peak, supplies from the Pacific Northwest begin to roll to market in appreciable and rapidly increasing quantities. In every week of the 1925 and 1926 seasons until the first of October, the three Pacific Coast states—California, Oregon, and Washington—contributed over 50 per cent of the weekly total of pear shipments originating in the whole country. Shipments from the two states, Oregon and Washington, constituted from 30 to 40 per cent of national pear shipments during the greater part of August and September, 1925. In 1926, however, a very early shipping season for California, the two northwest states accounted for from 35 to 60 per cent of weekly shipments throughout these two months.

*California Interstate Shipments from North of Tehachapi.*—In recent years approximately 99 per cent of the interstate shipments of pears from California have moved from the state by the end of October. (See figure 19 and table 19.) Shipments after the first of November seldom amount to 1 per cent of the season's total, and

as June shipments have averaged about 4 per cent in the last four years, it is clear that about 95 per cent of the fresh-pear shipments from the state move during the four months from July to October inclusive.

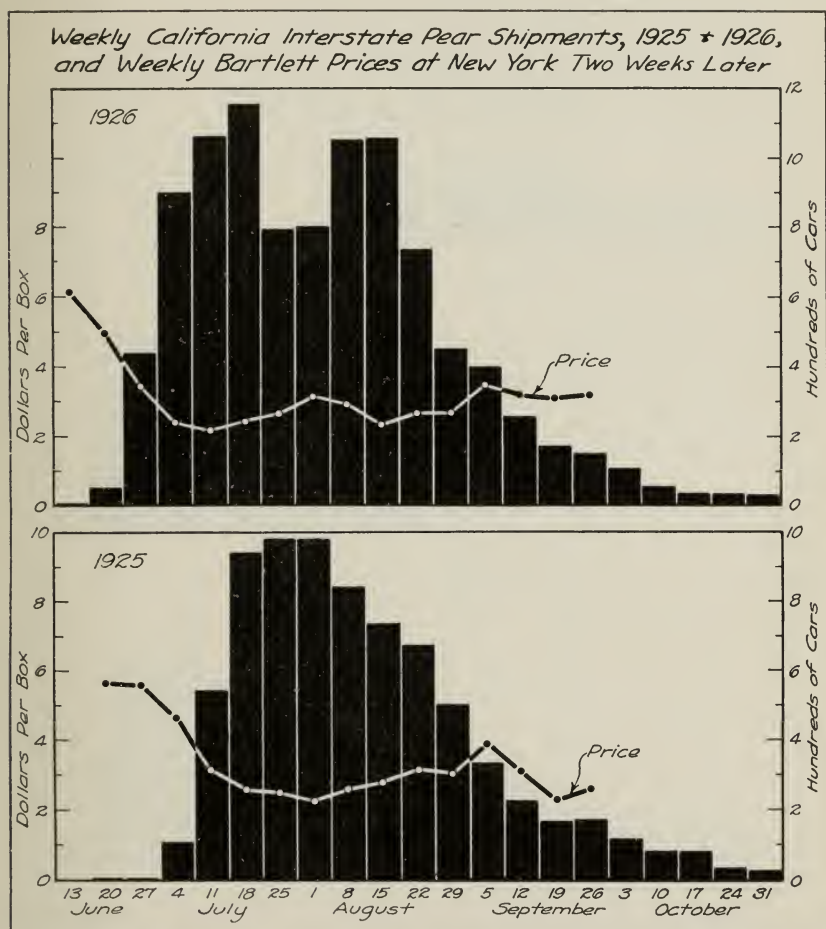


Fig. 19.—The heaviest movement of pears from the state occurs in July and August. The eastern price of California Bartlett's varies inversely with shipments from California two weeks previously.

(Data from tables 19 and 20.)

The week of heaviest shipments from the state has been about the third week in July in two of the last five years, namely in 1923 and in 1926. In the other three years, however, the peak came later, occurring about the last week of July in 1925, the first week of August in 1926, and the third week in August in 1927, an extremely

late pear season. In both 1925 and 1926, however, the weekly movement from the middle of July to the middle of August was so uniform that shipments in the peak weeks were but little larger than in the other weeks falling in this period.

TABLE 19  
WEEKLY CALIFORNIA PEAR SHIPMENTS, INTERSTATE NORTH OF TEHACHAPI,  
1923-1927, AVERAGE 1910-1914

| Week ending                   | 1923<br>cars | 1924<br>cars | 1925<br>cars | 1926*<br>cars | 1927*<br>cars | Average 1923-26 |                                  | Average 1910-14 |                                  |
|-------------------------------|--------------|--------------|--------------|---------------|---------------|-----------------|----------------------------------|-----------------|----------------------------------|
|                               |              |              |              |               |               | Cars            | Per cent<br>of season's<br>total | Cars            | Per cent<br>of season's<br>total |
| June 6.....                   |              | 1            |              |               |               |                 | 0.0                              |                 | 0.0                              |
| 13.....                       |              | 0            | 1            | 7             |               | 2               | 0.0                              |                 | 0.0                              |
| 20.....                       | 2            | 17           | 6            | 57            |               | 20              | 0.3                              | 3               | 0.1                              |
| 27.....                       | 107          | 208          | 7            | 440           | 3             | 190             | 2.5                              | 20              | 0.8                              |
| July 4.....                   | 513          | 424          | 109          | 900           | 6             | 486             | 6.4                              | 85              | 3.7                              |
| 11.....                       | 953          | 587          | 540          | 1,068         | 136           | 787             | 10.4                             | 192             | 7.4                              |
| 18.....                       | 1,100        | 509          | 946          | 1,157         | 494           | 928             | 12.3                             | 271             | 10.0                             |
| 25.....                       | 974          | 569          | 986          | 791           | 676           | 830             | 11.0                             | 335             | 12.6                             |
| Aug. 1.....                   | 771          | 578          | 983          | 800           | 849           | 783             | 10.4                             | 339             | 13.0                             |
| 8.....                        | 623          | 721          | 843          | 1,056         | 904           | 810             | 10.7                             | 316             | 12.1                             |
| 15.....                       | 470          | 609          | 733          | 1,062         | 1,024         | 719             | 9.5                              | 252             | 9.6                              |
| 22.....                       | 328          | 345          | 673          | 737           | 1,055         | 521             | 6.9                              | 193             | 7.4                              |
| 29.....                       | 204          | 261          | 498          | 451           | 899           | 354             | 4.7                              | 141             | 5.4                              |
| Sept. 5.....                  | 151          | 209          | 339          | 398           | 510           | 274             | 3.6                              | 107             | 4.5                              |
| 12.....                       | 109          | 119          | 230          | 255           | 483           | 178             | 2.4                              | 79              | 3.0                              |
| 19.....                       | 106          | 96           | 161          | 171           | 385           | 134             | 1.8                              | 77              | 3.0                              |
| 26.....                       | 105          | 103          | 170          | 155           | 152           | 133             | 1.8                              | 53              | 2.0                              |
| Oct. 3.....                   | 60           | 82           | 120          | 119           | 97            | 95              | 1.3                              | 40              | 1.5                              |
| 10.....                       | 82           | 66           | 73           | 68            | 89            | 72              | 1.0                              | 44              | 1.7                              |
| 17.....                       | 66           | 60           | 78           | 42            | 78            | 62              | 0.8                              | 27              | 1.0                              |
| 24.....                       | 52           | 33           | 43           | 46            | 56            | 44              | 0.6                              | 15              | 0.6                              |
| 31.....                       | 39           | 35           | 30           | 33            | 30            | 34              | 0.5                              | 9               | 0.3                              |
| Nov. 7.....                   | 26           | 16           | 14           | 20            | *             | 19              | 0.2                              | 5               | 0.2                              |
| 14.....                       | 24           | 12           | 12           | 26            | *             | 19              | 0.2                              | 2               | 0.1                              |
| 21.....                       | 9            | 16           | 4            | 11            | *             | 10              | 0.1                              | 3               | 0.1                              |
| Total of above weeks.....     | 6,874        | 5,676        | 7,599        | 9,870         | 7,926         | 7,504           | 99.4                             | 2,608           | 100.0                            |
| Grand total whole season..... | 6,913        | 5,716        | 7,690        | 9,890         | 8,100         | 7,552           | 100.0                            | 2,608           | 100.0                            |

\* Data for 1926 and 1927 are preliminary and subject to revision. About 95 cars were shipped from the state during November, 1927.

Source of data: Data compiled from the California Fruit News from the issues of the year following that for which the data are given except in the case of 1926 and 1927. The exact dates by weeks shown in the first column correspond approximately to those for which available weekly data for the different years are shown.

#### WEEKLY SALES OF PACIFIC COAST PEARS BY VARIETIES

*Comparison of Bartletts and Late Varieties.*—Figure 20,<sup>44</sup> which pictures the weekly sales of Pacific Coast Bartlett pears compared

<sup>44</sup> Figure 20 is based on table 36, page 107, "Weekly Sales of Pacific Coast Pears at New York Delivered-Auctions by Chief Varieties, 1926."

with those of late varieties on the New York delivered-auction market in 1926, gives some idea of the amount of competition between Bartletts and other varieties of Pacific Coast pears at different times during the season. Comparison of the upper two sections of this figure shows that California Bartletts dominated the market until

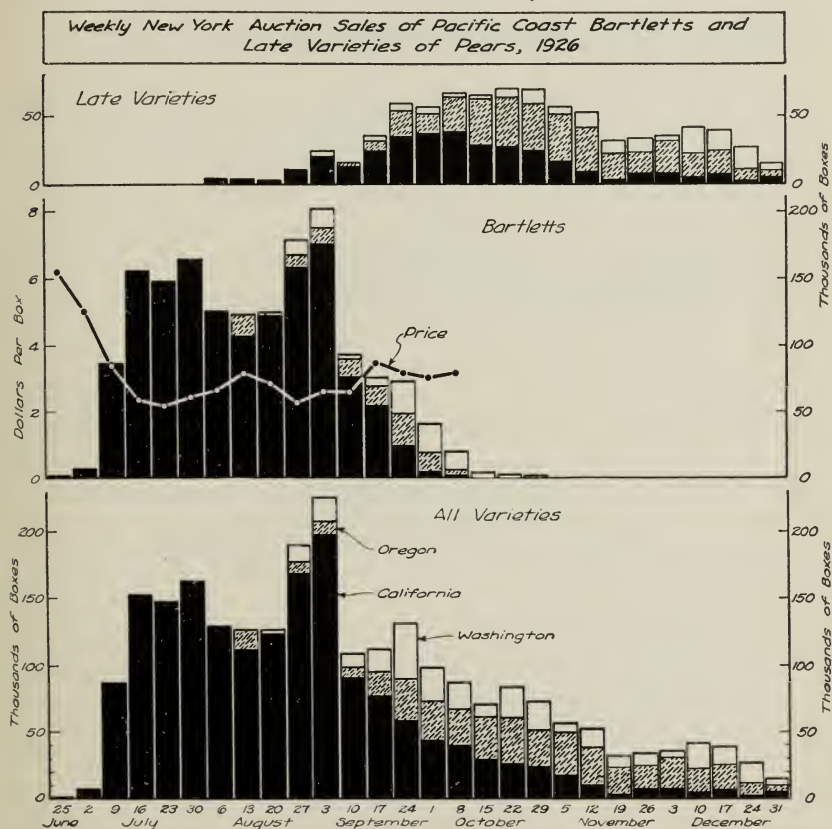


Fig. 20.—In 1926 California Bartletts dominated eastern pear markets until about the middle of September. By the middle of October practically all of the pears from the Pacific Coast were late varieties.

(Data from table 36, page 107.)

about the middle of September, as no large volume of Bartletts from any other section or of late varieties from any section were sold until after this date. During the next month, however, Bartlett pear sales rapidly declined to practically nothing, until by the middle of October late varieties from the Pacific Coast constituted practically all the sales of pears from this section. Sales of late varieties in appreciable

quantities began about the first week in September, when they amounted to about 25,000 boxes compared with over 200,000 boxes of Bartletts in the peak week of sales of this variety during the 1926 season. In the last week in September 60,000 boxes of late varieties were sold and from then until nearly the middle of November 60,000 to 70,000 boxes were sold each week, while after the last week in September, Bartlett sales became inconsequential, ceasing entirely by the end of October.

*California Bartletts Dominate Until Middle of September.*—Study of Figure 20 shows to what an extent supplies of California Bartlett pears dominated the New York delivered-auction markets throughout the season until the middle of September. Until the second week in August practically no other pears but California Bartletts were sold at auction. Sales of Pacific Northwest Bartletts, which began in August, amounted to 25,000 boxes, at the most, in any one week during the next five or six weeks, while 80,000 boxes or more of California Bartletts were sold in any one week during this period and in one week nearly 180,000. The largest sales of Pacific Northwest Bartletts occurred in the last two weeks of September, averaging over 40,000 boxes each week, in comparison with an average of less than 15,000 boxes of California Bartletts, which had almost ceased to move by this time.

*Total Weekly Sales of Late Varieties by States, 1926.*—The top section of figure 20 pictures the relative amounts of late varieties of pears sold each week on the New York delivered auctions which originated in the different Pacific Coast states in 1926. The earliest sales of the season, beginning in small amounts about the first week in August, came from California. About the first week in September, sales of late varieties from California totalled 20,000 boxes for the first time during the season and did not fall below this in any week during the next two months, averaging between 35,000 and 40,000 boxes for three weeks during this period.

Two or three thousand boxes of late varieties from the Pacific Northwest were sold as early as the first week in September. Not until the latter part of this month, however, did sales from this section reach a weekly volume of 20,000 boxes. From this date on, the proportion of sales from this section compared with those from California increased rather consistently, until about the second week in October they exceeded those of California. Thereafter they accounted for a large majority of the total, the proportion from California sinking to almost nothing by the middle of November.

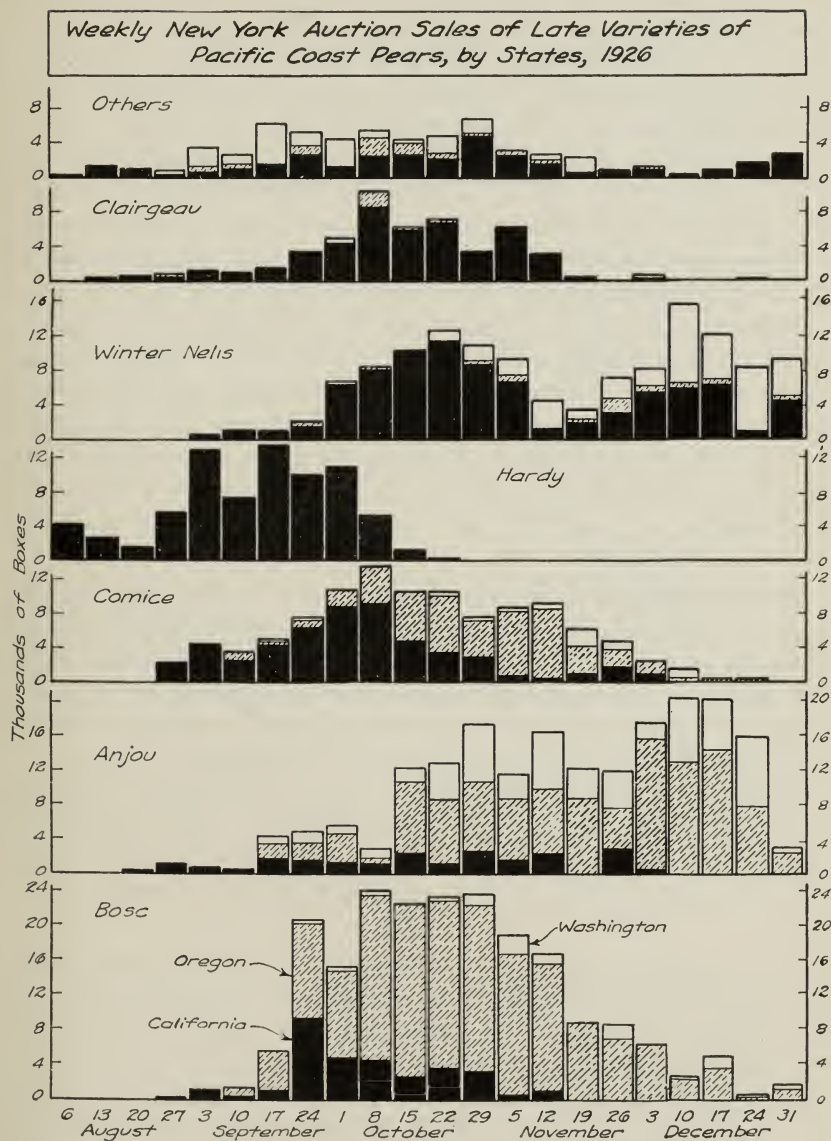


Fig. 21.—In August and September, Beurre Hardy was the outstanding Pacific Coast late variety sold in New York in 1926; in October, Bosc, Comice, Winter Nelis, and Clairegeau; in November and December, Anjou and Winter Nelis.

(Data from table 36, page 107.)

*Sales of Chief Late Varieties by Kinds.*—An idea of the approximate time at which the bulk of the chief varieties of late pears coming from the Pacific Coast were sold in New York in 1926 is given by figure 21. The approximate proportion of each variety originating in California, Oregon, and Washington is also shown separately. The **Beurre Hardy**, practically all of which originated in California, was the earliest of the late varieties to appear on the market. Although this variety was first sold in appreciable quantities in the first week in August, the larger part of it was sold in September, during which month sales averaged about 10,000 boxes a week. Practically all of the Beurre Hardy were off the market by the middle of November.

Following the Hardy in sales of any considerable volume early in the season, was **Comice**, the first appreciable sales of which occurred in the latter part of August, gradually increasing until an average of 10,000 boxes a week was sold during October and most of November. Very few Comice were sold after the first of December. Until the middle of October the majority of Comice originated in California, but thereafter a considerable and increasing majority were accounted for by the Pacific Northwest.

Sales of **Clairgeaus**, almost all of which are grown in California, began just about as early in the season as those of Hardy. Sales amounted to only about 1,000 boxes or less per week until the middle of September. The majority of sales were in October, during which month an average of about 6,000 boxes a week were sold. Almost no Clairgeaus were sold after the middle of November.

**Bosc** sales in 1926 began about the first of September. The bulk of the sales took place during a period of six weeks centering in October. By January 1, practically all Boses had been sold. About 90 per cent of the sales of this variety come from the Pacific Northwest.

Auction sales of **Anjous**, in 1926, began in small amounts in the latter part of August but did not become of great importance until the middle of October. Thereafter, however, until the end of the year, weekly sales averaged nearly 16,000 boxes, being exceeded only by the sales of one variety, Bosc, up to the middle of November. The majority of the Anjou sales before Christmas originated in Oregon, although Washington supplied a considerable proportion at times. California contributed but few, these few being sold largely before the middle of November. During January to March, inclusive, California contributes practically no Anjou pears to the New York market. Supplies from Oregon and Washington, however, were, next to those

of Winter Nelis, most plentiful during this period, amounting to about one-third of the total Anjou offerings from the Pacific Northwest.

Winter Nelis came upon the market in large quantities at about the same time as Anjou. Sales averaging nearly 10,000 boxes a week or more began about the first of October and continued to the end of the year except for a temporary decrease in November. A large majority of the Winter Nelis sales before November were of California origin. During most of the remainder of the year, however, Washington supplied a majority, Oregon contributing only a few. Most of the sales of this variety from Oregon apparently occur after Christmas. Washington, however, supplies a majority of the Winter Nelis sold during the winter and spring months. Because of the excellent keeping quality of Winter Nelis a larger volume is held in cold storage and sold during the period of January through May than of any other variety of pears. The limited available statistical evidence seems to indicate that perhaps one-half of the sales of this variety in New York City occur in the late winter and in the spring months.

The sales of other miscellaneous varieties occurred in relatively small amounts throughout the 1926 season from the first of August to the last of December. The bulk of the sales, however, were made in September and October. Flemish Beautys composed the bulk of the sales from Washington. Howells from Oregon were sold in small quantities during September and October. In the late winter and spring months the miscellaneous varieties largely come from California, a few Glout Moreceau and P. Barry being included, the bulk, however, being Easter Beurre, a very late keeper, most of which are sold in the spring months.

#### RELATION OF WEEKLY SUPPLY TO PRICE

*Object of Analysis.*—A study of the seasonal variation in fresh-pear prices from week to week and month to month and of their relation to available market supplies should be of practical value to growers and shippers in a number of ways. From the long-time point of view, such data, by enabling growers to visualize what are normally the best parts of the season in which to ship, give a clue to whether expansion of production of pears that are usually available for shipment at some particular time of the season is advisable at present or not. Thus information on seasonal variation in shipments and prices helps to decide wisely in what producing sections, if any, increased production seems advisable, and for what varieties the

market outlook seems best. From the short-time point of view, study of this kind also suggests advisable changes in the movement into and out of cold storage and when to ship to eastern markets, when to sell to the canneries, and when to divert from one market to another. In fact, a clear-cut picture of the seasonal variation in the prices and movement of pears and of other competing fruits is indispensable as a basis for decisions involving a better adjustment of production to probable future market demands and a better adjustment of the movement of the crop to seasonal changes in the condition of supply which affect current prices and market-distribution problems.

*Relation of Bartlett Prices and California Shipments.*—The degree of relationship between changes in the number of cars of pears shipped weekly from California during the first ten weeks of the 1925 and of the 1926 shipping season and average weekly prices of New York delivered-auction sales of California Bartletts two weeks later is pictured in figure 22. A comparison of the estimated prices (line  $d-d'$ ) with the actual prices shown by the black dots indicates that approximately 87 per cent of the rise and fall in the weekly price of California Bartletts on New York auction markets during the twenty weeks included was accounted for by the opposite movement in current arrivals of California pears available in eastern markets.<sup>45</sup> This same inverse relationship is also pictured for 1925 and for 1926 in figure 19, page 69, which shows the general tendency, during the greater part of the shipping season, for the price of California Bartlett pears to fall as the weekly arrivals in eastern markets from California increase, or to rise when arrivals are declining. This relationship is fairly consistent in these two seasons until about the middle of September, but thereafter other factors than prospective California arrivals in the eastern markets seem to affect the New York price of California Bartletts to a great extent.

The prices of California Bartletts in eastern markets shows a more definite tendency to follow a fairly well defined seasonal variation in movement than do the prices of many other fresh fruits. The average weekly variation in California Bartlett prices on the New York delivered-auction market for fifteen weeks of each season for the period 1917–1924, shows the average seasonal variation to be very similar to that pictured in figure 19 for 1925 and for 1926. On the basis of these facts Erdman and Wellman conclude that California

<sup>45</sup> The inverse correlation between prices and shipments, as shown in figure 22, is —0.935. It usually takes about one week to move refrigerated fruit by rail from railroad concentration points in California to Chicago and about twelve days to New York City.

*Relation Between Weekly New York Auction  
Price of California Bartletts and Weekly Pear  
Shipments from California Two Weeks Earlier  
First 10 Weeks of 1925 and of 1926 Seasons*

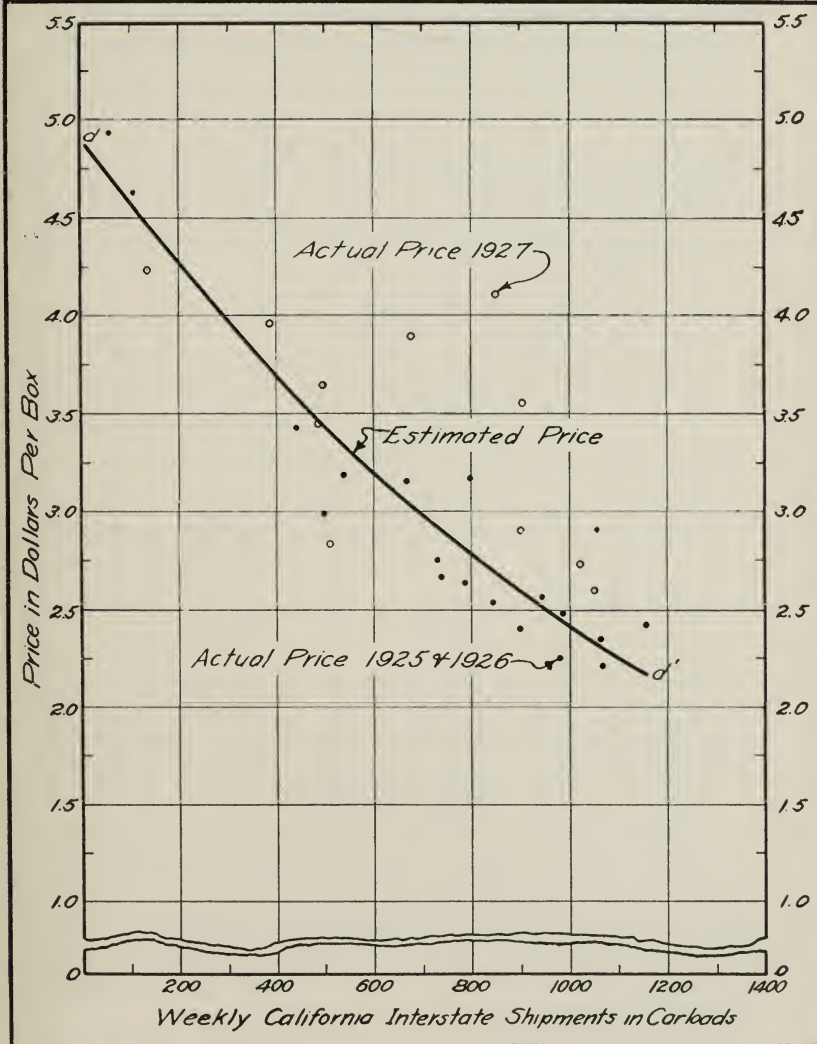


Fig. 22.—The black dots show the actual weekly New York auction price of California Bartletts during the first ten weeks of the 1925 and of the 1926 seasons, in relation to pear shipments from California two weeks earlier. The line  $d-d'$ , based upon these dots represents the average relationship between these weekly prices and previous shipments. The hollow dots show what actually happened to prices in 1927 as changes in shipments occurred, and indicate how much help the line  $d-d'$  would have been in predicting weekly changes in price on the basis of weekly shipments from California.

(Based on tables 19 and 20.)

“growers who are able to get the bulk of their pears on the market in the first few weeks of the season will ordinarily obtain a higher price than if their fruit were sold in the other weeks.”<sup>46</sup>

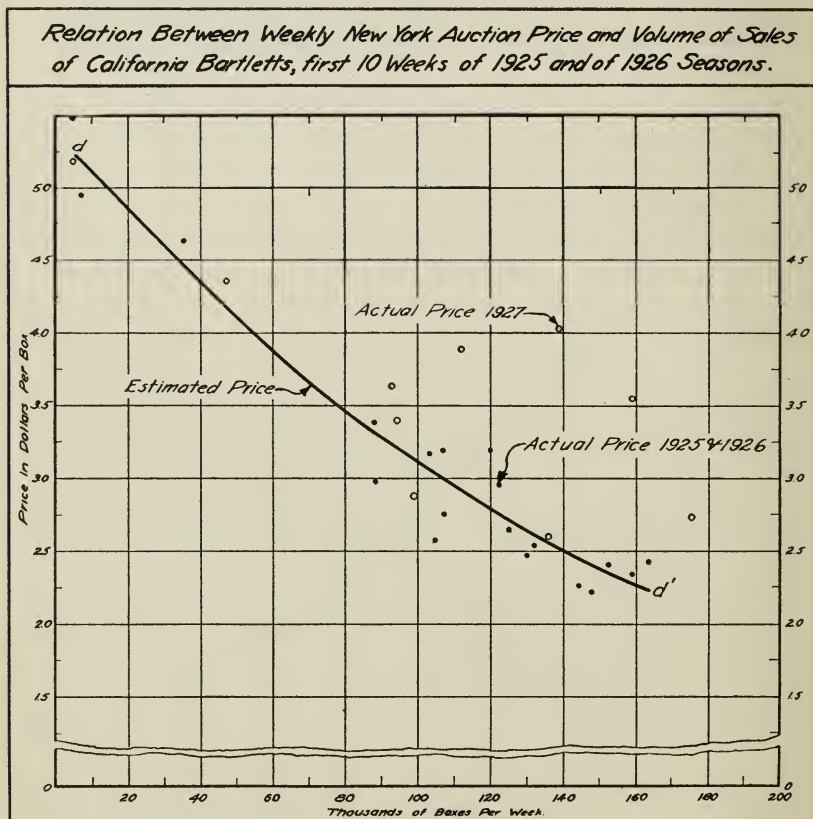


Fig. 23.—The black dots show the actual weekly New York price of California Bartletts, during the first ten weeks of the 1925 and 1926 seasons, in relation to the quantities sold on the delivered auction during the same weeks. The line  $d-d'$ , based upon these dots, represents the average relationship between weekly prices and sales. The hollow dots show what actually happened to weekly prices in the 1927 season (one of light shipments of peaches) as changes occurred in the weekly quantities sold, and indicate how much help the line  $d-d'$  would have been in estimating the probable price at which different quantities of Bartletts would sell during the 1927 season.

(Based on data from table 20.)

*Relation of Bartlett Prices and New York Auction Sales.*—Figure 23 shows that the relationship between the weekly New York delivered-auction price of California Bartletts and their volume of sales during

<sup>46</sup> This paragraph is based upon a figure and a brief discussion in: Erdman, H. E., and H. R. Wellman. Some economic problems involved in the pooling of fruit. California Agr. Exp. Sta. Bul. 432: 12, 13, fig. 1. 1927.

the same period of time shown in figure 22 is even closer than the relationship shown in the latter figure. According to the data upon which figure 23 is based, nearly 93 per cent of the changes in weekly average prices of California Bartlett sales in New York City can be accounted for by the quantities actually sold.<sup>47</sup> The relation of the weekly price and volume of sales of California Bartletts in the New York delivered-auction markets in 1926 which is shown in figure 20, page 71, also indicates the decisive tendency for prices to fall as sales increase and to rise as they decrease. This close inverse correlation can be seen to exist through the middle of September. After that date, however, other factors than the volume of California Bartlett sales seem to become the determining ones affecting their price.

TABLE 20

WEEKLY NEW YORK DELIVERED-AUCTION SALES OF CALIFORNIA BARTLETT PEARS,  
1925-1927

| Week ending  | 1925            |        | 1926            |        | 1927            |        |
|--------------|-----------------|--------|-----------------|--------|-----------------|--------|
|              | Number of boxes | Price  | Number of boxes | Price  | Number of boxes | Price  |
| June 26..... |                 |        | 1,160           | \$6.18 |                 |        |
| July 3.....  |                 |        | 7,630           | 4.94   |                 |        |
| 10.....      | 6,595           | \$5.58 | 87,455          | 3.40   |                 |        |
| 17.....      | 35,345          | 4.62   | 153,380         | 2.39   | 5,240           | \$5.37 |
| 24.....      | 119,004         | 3.18   | 148,090         | 2.20   | 46,750          | 4.24   |
| 31.....      | 114,680         | 2.57   | 163,845         | 2.42   | 92,365          | 3.65   |
| Aug. 7.....  | 129,935         | 2.47   | 124,990         | 2.63   | 111,800         | 3.84   |
| 14.....      | 144,520         | 2.25   | 107,895         | 3.17   | 139,580         | 4.05   |
| 21.....      | 132,020         | 2.53   | 122,255         | 2.90   | 159,170         | 3.71   |
| 28.....      | 117,310         | 2.75   | 159,440         | 2.33   | 175,224         | 2.77   |
| Sept. 4..... | 103,580         | 3.17   | 117,255         | 2.65   | 133,230         | 2.60   |
| 11.....      | 87,990          | 2.98   | 77,785          | 2.62   | 124,560         | 2.88   |
| 18.....      | 35,285          | 3.85   | 53,915          | 3.48   | 99,300          | 2.84   |
| 25.....      | 39,120          | 3.14   | 23,870          | 3.19   | 94,375          | 3.50   |
| Oct. 2.....  | 6,945           | 2.24   | 5,025           | 3.07   | 35,155          | 4.00   |
| 9.....       | 7,825           | 2.54   | 1,715           | 3.19   | 12,550          | 4.28   |

Source of data: Data compiled from the daily issues of the New York Daily Fruit Reporter. The prices are weekly weighted-average prices of delivered-auction sales in New York City. The dates indicated are for weeks ending in the 1925 season. Those for 1926 and 1927 vary slightly from these but are for the nearest corresponding weeks.

*Tendency to Inverse Correlation of Supply and Price.*—The relationships shown in figures 22 and 23 bring out the fact that the dominant cause of variations in California Bartlett pear prices in the New York market is changes in the current weekly supply of such pears during the greater part of the season when these pears

<sup>47</sup> The inverse correlation between weekly prices and volume of sales as shown in figure 23 is — 0.964.

are available. If no other factor than the weekly supply of California Bartlett pears affected the weekly price, one would expect all of the scattered dots above and below the line of "estimated price" to be located on the curve itself. The fact, however, that the actual prices do not in most cases fall on this curve indicates that other factors than the supply of California Bartlett pears (at least the measures of supply used in figures 22 and 23) affected the actual weekly prices. The extent to which these other factors affected prices is indicated by the amount by which the dots of actual prices scatter or diverge from the curve of estimated price.

Although a number of the factors, the effects of which are not measured by the relationships shown in the curves of estimated prices in the figures under discussion, are minor, in the aggregate they are important, accounting as they do for 13 per cent of the changes in price not accounted for by the curve in figure 22 and for about 7 per cent of the changes in price not accounted for by the corresponding curve of estimated prices in figure 23. Some of the more outstanding of these minor factors which cause changes in price from one season to another or from one week to another are changes in demand, such as may result from advertising or not advertising, for example, and from variations in the weather, from differences in the time of the season at which sold, and from changes in the available supplies and prices of competing fruits. Variations in quality, which are not always measurable, also affect prices. Psychological factors influencing dealers' opinions regarding demand and supply may likewise, at times, have an appreciable effect on prices.<sup>48</sup>

One would logically expect the price of California Bartletts to be relatively higher during the 1927 season than during the 1925 and 1926 seasons because of comparatively light supplies in 1927 of certain other fruits, particularly of peaches, which compete with pears during July and August. This conclusion is borne out by the fact that California Bartlett prices, as shown by the hollow dots in figures 22 and 23, were markedly higher during most of the 1927 shipping season, than during the 1925 and the 1926 seasons, both of which were characterized by heavy shipments of fresh peaches during July and August.

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<sup>48</sup> A more intensive study than it has been possible to make at this time would be necessary to measure the result of changes in each of these factors upon pear prices. An excellent example of such a study of a perishable is that made by Dr. Emil Rauchenstein on the factors influencing the variation in the price of Imperial Valley cantaloupes on the New York City market in recent years in *Economic Aspects of the Cantaloupe Industry*. California Exp. Sta. Bul. 419: 1-45. 1927.

*Practical Uses of Such Relationships.*—The curves of estimated prices in figures 22 and 23, carefully interpreted in the light of their limitations, should be useful in estimating what the weekly price of California Bartlett pears at New York is likely to be, judged by the supply that will probably influence the market in any given week. Such a forecast would be helpful to those confronted with the question of whether to accept an offer to purchase their pears at a definite price in California or whether to take the risk of shipping them east to be sold on their own account after arrival. It should also help to avoid shipping too many pears to the New York market in any one week.

In using these curves of estimated prices as a basis of roughly forecasting what California Bartlett pear prices are likely to be in some future season it must be remembered that the relationship between weekly supplies and prices of California Bartlett pears in the future may not be as close as in 1925 and 1926, the years upon which these curves are based. In fact, the relationship between weekly supplies and weekly prices is not nearly as consistent during the years 1916 to 1924 and during 1927 as during 1925 and 1926.

Forecasting California Bartlett prices cannot safely be done merely by the method of statistical analysis, the results of which are pictured in figures 22 and 23. Additional facts, some of which cannot be measured statistically, and a trained judgment that can ordinarily be acquired only as the result of intimate first-hand acquaintance with the business are likewise essential. The degree of relationship between weekly prices and the two separate measures of supply shown by the statistical analysis which has been employed herein, should, however, be of considerable help in price forecasting and in suggesting market adjustments, if intelligently used by those familiar with the problems of, and the more pertinent current facts involved in, the profitable marketing of California Bartlett pears.

*How to Use Figure 22 in Forecasting Prices.*—To illustrate how one can use the curve in figure 22, let us assume that 600 carloads have rolled in the week just passed and that we wish to know what the New York price will probably be two weeks hence. Locate 600 on the horizontal scale at the bottom of the figure and follow the vertical line to the point where it cuts the curve of estimated price. Then follow the horizontal line from this point to the point where it cuts the left-hand vertical scale of prices in dollars per box. It will be found that, judging from what happened in 1925 and 1926, when 600 carloads of pears are shipped from California in a week, the price two weeks later will probably be in the neighborhood of \$3.20.

TABLE 21

UNITED STATES CANNED-PEAR PACK BY CHIEF STATES FOR CENSUS YEARS FROM 1899 TO 1925

| State or section                | 1899      |                        | 1904      |                        | 1909      |                        | 1914      |                        | 1919       |                        | 1921      |                        | 1923      |                        | 1925       |                        |
|---------------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|-----------|------------------------|------------|------------------------|-----------|------------------------|-----------|------------------------|------------|------------------------|
|                                 | Cases     | Per cent of U.S. total | Cases     | Per cent of U.S. total | Cases     | Per cent of U.S. total | Cases     | Per cent of U.S. total | Cases      | Per cent of U.S. total | Cases     | Per cent of U.S. total | Cases     | Per cent of U.S. total | Cases      | Per cent of U.S. total |
| California.....                 | 497,938   | 64.7                   | 599,157   | 66.5                   | 495,829   | 67.9                   | 768,990   | 63.4                   | 1,049,922  | 51.5                   | 780,791   | 67.0                   | 1,016,624 | 55.8                   | 2,218,511  | 57.0                   |
| Washington.....                 | 8,167     | 1.1                    | 16,201    | 1.8                    | 13,201    | 1.8                    | 29,546    | 2.4                    | 176,878    | 8.9                    | 159,412   | 13.6                   | 309,658   | 17.1                   | 633,314    | 16.3                   |
| Oregon.....                     | 506,105   | 65.8                   | 615,358   | 68.3                   | 536,716   | 71.9                   | 822,354   | 67.7                   | 1,394,533  | 68.5                   | 1,485,245 | 12.5                   | 282,161   | 15.6                   | 525,998    | 13.7                   |
| Pacific Coast total.....        | 64,358    | 8.4                    | 58,646    | 6.5                    | 59,077    | 8.2                    | 107,724   | 8.9                    | 171,187    | 8.9                    | 1,086,448 | 93.1                   | 1,608,443 | 88.5                   | 3,377,823  | 87.0                   |
| New York.....                   | 106,449   | 13.9                   | 144,261   | 16.0                   | 77,069    | 10.6                   | 178,498   | 14.7                   | 185,610    | 9.2                    | 53,168    | 4.6                    | 57,490    | 3.1                    | 239,278    | 6.2                    |
| Maryland.....                   | 27,113    | 3.5                    | 38,969    | 4.3                    | 50,006    | 6.8                    | 65,913    | 5.4                    | 105,090    | 5.2                    | 6,766     | 0.6                    | .....     | .....                  | 69,705     | 1.8                    |
| New Jersey.....                 | 4,343     | 0.6                    | 4,526     | 0.5                    | 9,219     | 1.3                    | 8,395     | 0.7                    | 39,774     | 2.0                    | 15,805    | 1.4                    | .....     | .....                  | 13,648     | 0.4                    |
| Michigan.....                   | 60,282    | 7.8                    | 39,694    | 4.4                    | 7,898     | 1.2                    | 31,852    | 2.6                    | 125,416    | 6.2                    | 4,017     | 0.3                    | 151,991   | 8.4                    | 123,962    | 3.2                    |
| All other states.....           | 768,650   | 100.0                  | 901,454   | 100.0                  | 728,984   | 100.0                  | 1,214,736 | 100.0                  | 2,021,610  | 100.0                  | 1,165,804 | 100.0                  | 1,817,924 | 100.0                  | 55,501     | 1.4                    |
| United States cases, total..... | 2,188,201 | .....                  | 2,192,085 | .....                  | 1,833,214 | .....                  | 3,853,700 | .....                  | 14,202,963 | .....                  | 7,538,673 | .....                  | 9,389,978 | .....                  | 20,898,470 | .....                  |
| Value, total.....               | \$2.85    | .....                  | \$2.43    | .....                  | \$2.52    | .....                  | \$3.17    | .....                  | \$7.03     | .....                  | \$6.46    | .....                  | \$5.16    | .....                  | \$5.38     | .....                  |
| Value per case.....             | \$3.50    | .....                  | \$2.76    | .....                  | \$2.42    | .....                  | \$3.14    | .....                  | \$3.04     | .....                  | \$4.45    | .....                  | \$3.37    | .....                  | \$3.38     | .....                  |
| Deflated value per case.....    | .....     | .....                  | .....     | .....                  | .....     | .....                  | .....     | .....                  | .....      | .....                  | .....     | .....                  | .....     | .....                  | .....      | .....                  |

Data on number of cases packed are compiled from federal censuses of manufactures. In a few cases revisions of the data for one census have been taken from the succeeding census report.

The pack is given in standard cases of 24 No. 2½ cans for every year except 1925. In 1925 the pack as here given by states is in actual number of cases. The total pear pack in standard cases in 1925 was 3,533,379 or slightly smaller than the pack in actual number of cases (regardless of size of cans) of 3,879,917. Standard cases as given by the census in 1914 and preceding years as the equivalent of 24 No. 3 cans have been converted to the equivalent of 24 No. 2½ cans by multiplying by 1.143. Beginning with 1919 standard cases of canned pears are given by the Census Bureau as the equivalent of 24 No. 2½ cans. The value per case has been deflated by dividing by the U. S. Bureau of Labor Statistics all-commodity wholesale-price index for the United States for fiscal years July to June inclusive converted to a 1910-1914 base as 100.

### PRODUCTION OF CANNING PEARS

*Pacific Coast Dominates the Canning-Pear Industry.*—Reference to figure 24 and to table 21 shows the outstanding importance of the canned-pear pack of the Pacific Coast as compared with that of the rest of the United States. In the last few years the three states of California, Washington, and Oregon have produced on an average about 90 per cent of the national output of canned pears. New York, the only other state the output of which is large enough to mention, has packed about 4 or 5 per cent of the canned pears in recent year.<sup>49</sup> California has packed nearly 60 per cent, Oregon slightly less than 15 per cent, and Washington slightly more than 15 per cent.

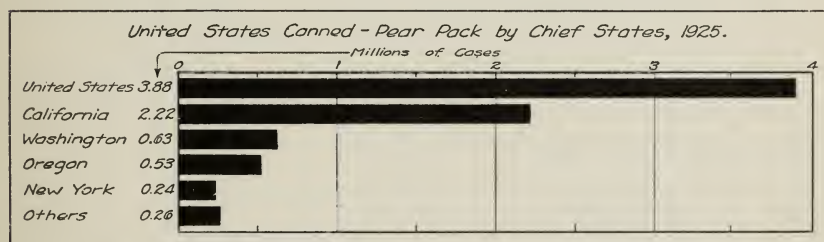


Fig. 24.—The Pacific Coast produces about 90 per cent of the national canned-pear pack, California alone contributing nearly 60 per cent of the total.

(Data from table 21.)

*Proportion of Pear Crop Canned.*—There has been not only a very great increase in tonnage of pears canned on the Pacific Coast during the last fifteen or twenty years, but there has likewise been a noteworthy increase in the proportion of the total crop utilized for canning in this section. Computations based on tables 21 and 30 (pp. 82 and 101) indicate that about 8 per cent of the total United States pear crop was canned in pre-war days, whereas approximately 15 per cent has been so utilized in the last three or four years. This approximate doubling of the proportion of the national crop canned is almost entirely due to the fact that the pear-canning industry on the Pacific Coast has developed proportionately much faster than the production of this section has grown. An average of perhaps 15 per cent of the coast crop was canned in 1909 and 1914. California dominated this average, however, with 22 per cent of the crop canned, while

<sup>49</sup> This statement regarding the New York canned-pear pack is based on mimeographed statistics of the pack issued by the Association of New York State Cannerymen, and also the Federal Census data shown in table 21.

only 3 or 4 per cent of the crop in Washington and in Oregon was canned. An average for the years 1923 and 1925 shows that about 22 per cent of the pear crop of the Pacific Coast has been canned in recent years. Washington utilized 16 per cent of her crop in this manner, California 25 per cent, and Oregon 31 per cent.

TABLE 22

UNITED STATES EXPORTS OF CANNED PEARS, FISCAL YEARS BEGINNING JULY 1, 1919-1926

| Year<br>beginning<br>July 1 | Quantity exported |                               |                                 |                                        | Value of exports                      |                     |                                       |                     | U. S. pack                    |               |
|-----------------------------|-------------------|-------------------------------|---------------------------------|----------------------------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|-------------------------------|---------------|
|                             | Tons              | Thou-<br>sands<br>of<br>cases | Per<br>cent of<br>U. S.<br>pack | Per cent<br>of U.S.<br>produc-<br>tion | Price                                 |                     | Purchasing power                      |                     | Thou-<br>sands<br>of<br>cases | Tons          |
|                             |                   |                               |                                 |                                        | Total<br>thou-<br>sands of<br>dollars | Per case<br>dollars | Total<br>thou-<br>sands of<br>dollars | Per case<br>dollars |                               |               |
| 1                           | 2                 | 3                             | 4                               | 5                                      | 6                                     | 7                   | 8                                     | 9                   | 10                            | 11            |
| 1919.....                   |                   |                               |                                 |                                        | 2,620                                 |                     | 1,134                                 |                     |                               |               |
| 1920.....                   |                   |                               |                                 |                                        | 3,851                                 |                     | 2,059                                 |                     |                               |               |
| 1921.....                   |                   |                               |                                 |                                        | 4,254                                 |                     | 2,934                                 |                     |                               |               |
| 1922.....                   | 24,679            | 1,097                         | 44                              | 5.0                                    | 6,105                                 | 5.57                | 3,839                                 | 3.50                | 2,500                         | 65,789        |
| 1923.....                   | 19,215            | 854                           | 47                              | 4.5                                    | 4,144                                 | 4.85                | 2,708                                 | 3.17                | 1,818                         | 47,842        |
| 1924.....                   | 26,925            | 1,197                         | 53                              | 6.0                                    | 6,446                                 | 5.39                | 4,080                                 | 3.41                | 2,240                         | 58,948        |
| 1925.....                   | 37,938            | 1,686                         | 47                              | 7.6                                    | 9,015                                 | 5.35                | 5,984                                 | 3.36                | 3,593                         | 94,553        |
| 1926.....                   | 33,052            | 1,469                         | 44                              | 5.4                                    | 6,654                                 | 4.53                | 4,436                                 | 3.02                | 3,300                         | 86,842        |
| <i>Average 1922-26..</i>    | <i>28,362</i>     | <i>1,261</i>                  | <i>47</i>                       | <i>5.7</i>                             | <i>6,473</i>                          | <i>5.13</i>         | <i>4,209</i>                          | <i>3.34</i>         | <i>2,690</i>                  | <i>70,795</i> |

Sources of data:

Col. 2.—Net pounds exported exclusive of package and tin. Compiled from Monthly Summary of Foreign Commerce. Quantities of canned-pear exports are not available before 1922.

Col. 3.—Pounds converted to approximate number of cases by dividing by 45.

Col. 4.—Based on data in table 21, page 82.

Col. 5.—Based on data in table 30, p. 101.

Col. 6.—Export valuation compiled from Monthly Summary of Foreign Commerce.

Col. 7.—Average value per case computed by dividing items in col. 6 by items for corresponding year in col. 3.

Col. 8.—Dollars of current value in col. 6 converted to approximate purchasing power in terms of dollars of average value for the five years 1910-1914, by dividing items in col. 6 by the U. S. Bureau of Labor Statistics all-commodity wholesale-price index for the United States and multiplying by 100. (See col. 4, table 9, page 47.)

Col. 9.—Average purchasing power per case computed by dividing items in col. 8 by items for corresponding years in col. 3.

Col. 10.—Data for crop years 1923 and 1925 from table 21, page 82; for the other years estimated approximately on the basis of reports of canners' associations covering California, Oregon, Washington, and New York.

Col. 11.—Cases in col. 10 converted to approximate fresh tonnage utilized by dividing items in col. 10 by 40.

*Rapid Increase in National Canned-Pear Pack.*—Figure 25 pictures the rapid increase in the output of canned pears which has occurred in the United States in the last two decades and enables one to compare this increase with the even more rapid upward trend in the output of several other important competing canned fruits.

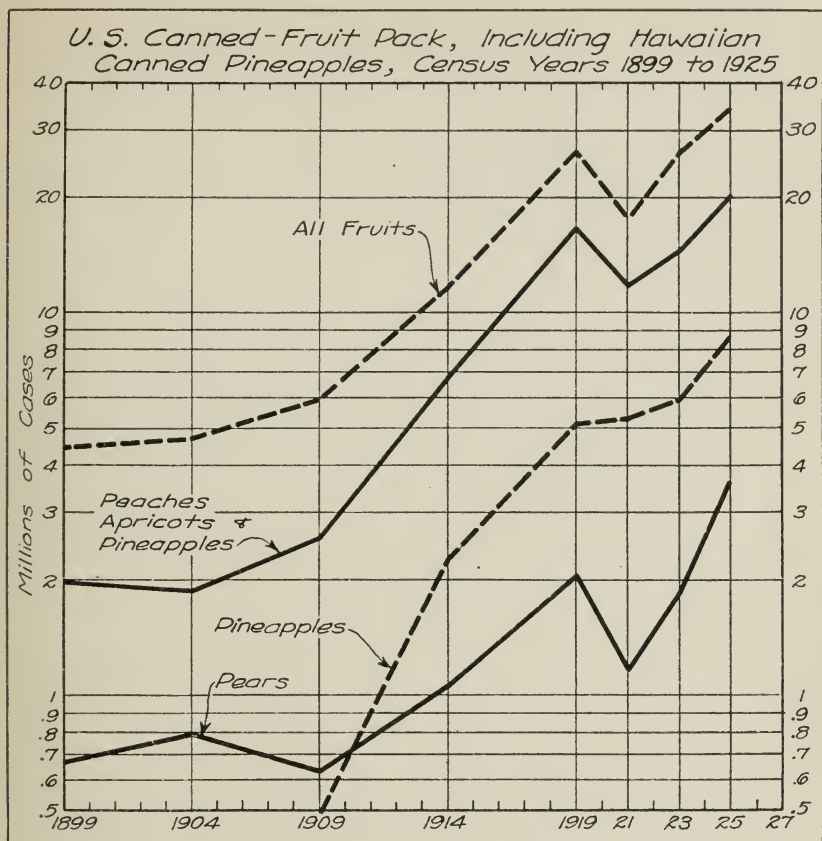


Fig. 25.—The United States canned-pear pack has tripled since pre-war days and the pack of peaches and pineapples has increased even more rapidly.

(Data from table 23.)

For ease of comparison the relative increases in the canned pack of each of the chief fruits are shown in table 23 as percentages of the average for the two years 1909 and 1914. Reference to these data and to figure 25 brings out the fact that the output of canned pears in this country in 1923 and 1925 averaged nearly three times that for the pre-war years 1909 and 1914. The canned-pear output increased somewhat more rapidly than pears, while that of Hawaiian pineapple multiplied by five. In the same period the canned pack of apricots and of all fruits other than peaches, pears, and pineapples (chiefly apples, berries, and plums) increased more slowly than that of pears.

TABLE 23

UNITED STATES CANNED-FRUIT PACK FOR CENSUS YEARS FROM 1899 TO 1925, BY  
CHIEF KINDS OF FRUIT, INCLUDING HAWAIIAN CANNED PINEAPPLES

| Year                                     | Total      | Total of<br>peaches,<br>pears, apricots,<br>and pineapples | Total of<br>peaches,<br>apricots, and<br>pineapples | Pears     | Peaches   | Apricots  | Pine-<br>apples | All others |
|------------------------------------------|------------|------------------------------------------------------------|-----------------------------------------------------|-----------|-----------|-----------|-----------------|------------|
| 1                                        | 2          | 3                                                          | 4                                                   | 5         | 6         | 7         | 8               | 9          |
| Cases                                    |            |                                                            |                                                     |           |           |           |                 |            |
| 1899.....                                | 5,107,714  | 3,033,937                                                  | 2,265,287                                           | 768,650   | 1,656,614 | 607,673   | 1,000           | 2,073,777  |
| 1904.....                                | 5,315,579  | 3,035,935                                                  | 2,133,971                                           | 901,964   | 1,491,463 | 617,008   | 25,500          | 2,279,644  |
| 1909.....                                | 6,786,403  | 3,624,609                                                  | 2,895,625                                           | 728,984   | 1,677,024 | 720,301   | 498,300         | 3,161,794  |
| 1914.....                                | 12,959,624 | 8,569,085                                                  | 7,354,451                                           | 1,214,634 | 3,895,236 | 1,202,225 | 2,257,000       | 4,390,539  |
| 1919.....                                | 26,279,047 | 18,740,209                                                 | 16,718,599                                          | 2,021,610 | 7,706,855 | 3,939,768 | 5,071,976       | 7,538,838  |
| 1921.....                                | 17,771,795 | 12,901,777                                                 | 11,736,573                                          | 1,165,204 | 5,417,213 | 1,056,857 | 5,262,503       | 4,870,018  |
| 1923.....                                | 26,146,920 | 16,314,663                                                 | 14,496,739                                          | 1,817,924 | 7,039,334 | 1,561,658 | 5,895,747       | 9,832,257  |
| 1925.....                                | 34,104,114 | 24,161,789                                                 | 20,568,410                                          | 3,593,379 | 9,898,740 | 1,941,090 | 8,728,580       | 9,942,325  |
| Averages:                                |            |                                                            |                                                     |           |           |           |                 |            |
| 1909 and 1914                            | 9,873,018  | 6,096,851                                                  | 5,125,044                                           | 971,807   | 2,786,131 | 961,263   | 1,377,650       | 3,776,167  |
| 1923 and 1925                            | 30,125,517 | 20,238,226                                                 | 17,532,574                                          | 2,705,652 | 8,469,037 | 1,751,374 | 7,312,164       | 9,887,291  |
| Per cent of total                        |            |                                                            |                                                     |           |           |           |                 |            |
| 1899.....                                | 100        | 59.4                                                       | 44.3                                                | 15.1      | 32.4      | 11.9      | 0.0             | 40.6       |
| 1904.....                                | 100        | 57.0                                                       | 40.1                                                | 17.0      | 28.0      | 11.6      | 0.5             | 42.9       |
| 1909.....                                | 100        | 53.4                                                       | 42.7                                                | 10.7      | 24.7      | 10.6      | 7.4             | 46.6       |
| 1914.....                                | 100        | 66.1                                                       | 67.0                                                | 11.1      | 35.5      | 10.9      | 20.6            | 33.9       |
| 1919.....                                | 100        | 71.3                                                       | 63.6                                                | 7.7       | 29.3      | 15.0      | 19.3            | 28.7       |
| 1921.....                                | 100        | 72.6                                                       | 66.0                                                | 6.6       | 30.5      | 5.9       | 29.6            | 27.4       |
| 1923.....                                | 100        | 62.4                                                       | 55.4                                                | 7.0       | 26.9      | 6.0       | 22.5            | 37.6       |
| 1925.....                                | 100        | 70.8                                                       | 60.3                                                | 10.5      | 29.0      | 5.7       | 25.6            | 29.2       |
| Averages:                                |            |                                                            |                                                     |           |           |           |                 |            |
| 1910 and 1914                            | 100        | 61.6                                                       | 51.8                                                | 9.8       | 28.2      | 9.7       | 13.9            | 38.4       |
| 1923 and 1925                            | 100        | 67.2                                                       | 58.2                                                | 9.0       | 28.1      | 5.8       | 24.3            | 32.8       |
| Per cent of 1909 and 1914 average as 100 |            |                                                            |                                                     |           |           |           |                 |            |
| 1899.....                                | 52         | 50                                                         | 44                                                  | 79        | 60        | 63        | .....           | 55         |
| 1904.....                                | 54         | 50                                                         | 42                                                  | 93        | 54        | 64        | 2               | 60         |
| 1909.....                                | 69         | 59                                                         | 51                                                  | 75        | 60        | 75        | 36              | 84         |
| 1914.....                                | 131        | 141                                                        | 143                                                 | 125       | 140       | 125       | 164             | 116        |
| 1919.....                                | 266        | 307                                                        | 326                                                 | 208       | 276       | 411       | 368             | 200        |
| 1921.....                                | 180        | 212                                                        | 229                                                 | 120       | 195       | 110       | 382             | 129        |
| 1923.....                                | 265        | 268                                                        | 282                                                 | 187       | 253       | 163       | 428             | 261        |
| 1925.....                                | 346        | 396                                                        | 400                                                 | 370       | 355       | 202       | 634             | 263        |
| Averages:                                |            |                                                            |                                                     |           |           |           |                 |            |
| 1910 and 1914                            | 100        | 100                                                        | 100                                                 | 100       | 100       | 100       | 100             | 100        |
| 1923 and 1925                            | 315        | 332                                                        | 342                                                 | 278       | 304       | 183       | 530             | 262        |

Data on the number of cases of all fruits but Hawaiian pineapples are compiled from federal censuses of manufactures. The data on the Hawaiian canned-pineapple pack for every year but 1899 are from the Cal-Pac Annual 1926: 9 (published by the California Packing Corporation at San Francisco). The 1899 figure is an assumed figure based on an estimate of the Hawaiian canned-pineapple pack for 1900 of about 1,200 cases according to J. D. Dole in the California Fruit Grower Annual Statistical Review, p. 79. Dec. 30, 1911.

The pack as given by the census in standard cases of 24 No. 3 cans for all years through 1914 and the equivalent of 24 No. 2½ cans beginning with the 1919 census has been converted to the equivalent of 24 No. 2½ cans previous to 1919 by multiplying by 1.143.

Canned peaches, pears, pineapples, and apricots probably compete more directly and more keenly with one another than they do with other canned fruits such as berries, apples, plums, and cherries. For this reason the increase in the canned-pear pack in the past twenty-five or thirty years is compared with that of the four as a group and with all of the four but pears themselves in figure 25. The rapid increase in the output of Hawaiian canned pineapples is largely responsible for the fact that the average canned pack of the four fruits—peaches, pears, apricots, and pineapples—for 1923 and 1925 was about 3.3 times the 1909 and 1914 average, rising from about 62 per cent of the total canned-fruit pack of the country to about 67 per cent. By leaving pears out of this group we find that the United States canned pack of peaches, pineapples, and apricots as a whole is about 3.4 times the pre-war average and now accounts for about 58 per cent of all canned fruits, compared with about 52 per cent before the war.

*Trend of the California and Northwest Pack.*—The California pack of over two million cases of canned pears in each of the two years 1925 and 1926 is shown in table 23 to be almost three times the pre-war output. The data in this table and other available information<sup>50</sup> indicate that the canned-pear pack of the Pacific northwest averaged about 1¼ million cases in the two years 1925 and 1926. Compared with an average of about 41,000 cases for the years 1909 and 1914, the present pack of these two states, Washington and Oregon, is nearly 30 times greater than before the war, showing that, relatively, the output of canned pears packed in the Pacific Northwest has increased very much more rapidly than in California.

This rapid increase is due to the fact that the canning-pear industry of the Northwest was in its infancy just before the war, producing less than five per cent of the national output of canned pears, and hence its increase of nearly a million cases has meant a very great proportional increase. On the other hand the California fruit-canning industry was well developed by 1900, averaging from then to 1914 at least a half-million cases of canned pears a year (see figure 26), or about the quantity packed in either Washington or Oregon at the present time. The relative increase in the canned-pear pack of the Northwest since pre-war days as compared with California can likewise be illustrated by the fact that over 65 per cent of the average pack of the United States for 1909 and 1914 was canned in

<sup>50</sup> Data on the canned fruit and vegetable pack of Oregon, Washington, and Idaho separately by kinds of fruit and vegetables are available for the years 1919 to date, and are now compiled annually by the Northwest Cannery Association, Board of Trade Building, Portland, Oregon.

California and less than 5 per cent in the Pacific Northwest, whereas in 1923 and 1925 an average of about 57 per cent came from California and 30 per cent from the Northwest.



Fig. 26.—The commercial output of pears in California has increased rapidly in the last twenty years. Fresh shipments out of the state have increased slightly faster than the tonnage utilized in canning and drying and as a result the proportion canned and dried is smaller than before the war. In the last three years 58 per cent of the commercial output of the state has been shipped east, about 30 per cent canned, and 12 per cent dried.

(Data from table 31, page 102.)

## PRICE AND PURCHASING POWER OF CANNING PEARS

*Purchasing Power of Canning Pears, 1905-1927.*<sup>51</sup>—The trend of the purchasing power per ton paid for California canning Bartletts is shown in figure 27 to have declined but little in the last twenty years. A glance at figure 24, and at the central section of figure 26, shows that this decline is slight in comparison with the substantial increase in the canned-pear output of California and of the United States during this period. Obviously the domestic and the foreign demand for canned pears must have increased much more rapidly than the output to prevent a much more appreciable decline in their purchasing power than has actually occurred.

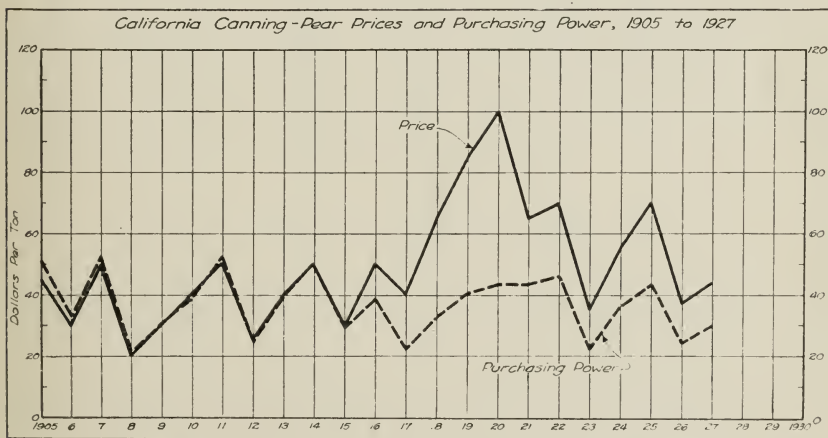


Fig. 27.—The purchasing power of California canning Bartletts has declined but slightly in the last two decades compared with big increase in the amount canned.

(Data from table 24.)

*Relation of Price to Canned-Pear Pack.*—Apparently the major factor determining the amount of pears that are canned in any year is the price paid by the canneries. From 1913 to date there has not been an exception to the rule that an increase in the purchasing power per ton of canning pears over the previous year has resulted in an increased quantity of California pears being packed or, conversely, that a decrease in price has been accompanied by a decline in the amount packed.

<sup>51</sup> See pages 36-43 for a discussion of the price and purchasing power of Pacific Coast pears in eastern markets, and page 99 for a very brief discussion of California dried-pear prices and purchasing power.

TABLE 24  
APPROXIMATE PRICE AND PURCHASING POWER OF CALIFORNIA CANNING BARTLETTES,  
1905-1927

| Crop year                   | Price       |                                | Purchasing power |                                | All-commodity<br>wholesale-price<br>index |
|-----------------------------|-------------|--------------------------------|------------------|--------------------------------|-------------------------------------------|
|                             | Per ton     | Per cent of<br>1910-14 average | Per ton          | Per cent of<br>1910-14 average |                                           |
|                             | 1           | 2                              | 3                | 4                              | 5                                         |
| <i>1910-14 Average.....</i> | <i>\$41</i> | <i>100</i>                     | <i>\$41</i>      | <i>100</i>                     | <i>100</i>                                |
| 1905.....                   | 45          | 110                            | 51               | 125                            | 88                                        |
| 1906.....                   | 30          | 73                             | 33               | 81                             | 90                                        |
| 1907.....                   | 50          | 122                            | 53               | 128                            | 95                                        |
| 1908.....                   | 20          | 49                             | 22               | 53                             | 92                                        |
| 1909.....                   | 30          | 73                             | 30               | 74                             | 99                                        |
| 1910.....                   | 40          | 98                             | 39               | 95                             | 103                                       |
| 1911.....                   | 50          | 122                            | 53               | 128                            | 95                                        |
| 1912.....                   | 25          | 61                             | 25               | 60                             | 101                                       |
| 1913.....                   | 40          | 98                             | 39               | 96                             | 102                                       |
| 1914.....                   | 50          | 122                            | 50               | 122                            | 100                                       |
| 1915.....                   | 30          | 73                             | 29               | 71                             | 103                                       |
| 1916.....                   | 50          | 122                            | 39               | 95                             | 129                                       |
| 1917.....                   | 40          | 98                             | 22               | 54                             | 180                                       |
| 1918.....                   | 65          | 159                            | 33               | 80                             | 198                                       |
| 1919.....                   | 85          | 208                            | 40               | 99                             | 210                                       |
| 1920.....                   | 100         | 244                            | 43               | 106                            | 230                                       |
| 1921.....                   | 65          | 159                            | 43               | 106                            | 150                                       |
| 1922.....                   | 70          | 171                            | 46               | 112                            | 152                                       |
| 1923.....                   | 35          | 86                             | 22               | 54                             | 157                                       |
| 1924.....                   | 55          | 134                            | 36               | 88                             | 152                                       |
| 1925.....                   | 70          | 171                            | 43               | 105                            | 162                                       |
| 1926.....                   | 37          | 90                             | 24               | 59                             | 154                                       |
| 1927.....                   | 44          | 107                            | 30               | 73                             | 149                                       |
| 1928.....                   |             |                                |                  |                                |                                           |

Sources of data:

Col. 1.—Approximate average price per ton paid by canners for No. 1 California canning pears. Data for 1905-1918 based upon the prices paid by large commercial canners and for 1919-1927 based largely upon prices paid by the California Pear Growers Association to its members.

Col. 3.—Purchasing power per ton is calculated by dividing the price in col. 1 by the all-commodity wholesale-price index in col. 5 for the corresponding year and multiplying by 100.

Col. 5.—U. S. Bureau of Labor Statistics all-commodity wholesale-price index for the United States for calendar years, converted to a 1910-1914 base of 100. Data from U. S. Bur. Agr. Econ. Agricultural Situation 12 (4): 6. April 1928.

This tendency for the size of the canned-pear pack to vary directly with changes in the price paid to growers for canning pears leads to a serious problem, the satisfactory solution of which is of vital importance to both growers and canners. To raise the price for canning pears diverts a larger tonnage from growers to canneries, but to raise the price for canned pears decreases the amount that consumers will buy. The canner, however, if he pays a high price for canning pears must either reduce his expenses or else receive a somewhat proportionally higher price for his canned pears, if his business is to be profitable. The price paid for canning pears has too fre-

quently been such as to create a discrepancy between the amount packed and the greatest amount which could be sold to the consumer at a price reasonably profitable to the packers.

Some method of securing a better adjustment between the canning price, the resulting pack, and the actual price at which it can be moved into consumption, is perhaps the most important problem involved in stabilizing the canned-fruit industry to the benefit of both canners and growers. The growers are interested in seeing that the canneries do not recoup the losses due to paying too high a price for canning fruit one year, by paying an unreasonably low price the following year. The canners themselves are interested in seeing that the fruit-canning business be stabilized enough to avoid losses due to this cause and thus to eliminate the necessity of recouping such losses. An intensive study of this vital problem should commend itself to the California fruit industry because of its great practical value. The growers of other canning fruits, particularly the cling-peach growers, are confronted with this same serious problem. Such a study, however, is beyond the scope of the present bulletin.

#### EXPORTS OF CANNED PEARS

*Large and Increasing Exports of Canned Pears.*—In the last five years, an average of approximately  $1\frac{1}{4}$  million cases of canned pears have been exported each year, or 47 per cent of the national canned-pear output and approximately 6 per cent of the total crop of pears. The percentage of the national pack exported in recent years has varied from about 44 to 53 per cent. Of our total exports of canned peaches, pears, and apricots in recent years, averaging about 140 million pounds, pears have constituted about 54 million pounds, or  $38\frac{1}{2}$  per cent, peaches about 61 million pounds, or  $43\frac{1}{2}$  per cent, and apricots approximately 25 million pounds, or almost 18 per cent.<sup>52</sup>

Judging from the available figures shown in table 22, there seems to be a tendency for exports to vary somewhat in proportion to the United States pack, which, as shown in figure 25, has been increasing. Rough estimates of the quantity of canned pears and of other canned fruits exported from the United States before the war, based upon calculations made by the trade, indicate that exports of canned pears have at least kept pace with, and may even have somewhat exceeded,

<sup>52</sup> Computations based on data compiled from U. S. Commerce and Navigation for the years 1923–1926. A brief discussion of our output and exports of canned peaches will be found in Wellman, H. R. Peaches. California Agr. Ext. Cir. 1: 1–64. 1926; and of canned apricots in the bulletin by the same author: California Agr. Exp. Sta. Bul. 423: 1–42. 1927.

the great increase in the pack since pre-war years.<sup>53</sup> The marked upward trend of canned-pear exports indicated by these estimates is likewise in a general way substantiated by statistics of the quantity of canned fruits, other than pineapples, imported into the United Kingdom annually from 1910 to 1924.<sup>54</sup>

Aside from pineapples, imports of canned fruit into the United Kingdom chiefly consist of apricots, pears, and peaches. The fact that this has been true for many years and that the United Kingdom has consistently been the outstanding foreign market for canned fruits enables one to approximate the trend of the total quantity of these three kinds of canned fruits exported from the United States during the last twenty years. United States exports to the British Isles of fruits other than pineapples canned in syrup, during the five-year period of 1921–1925 were approximately 3.8 times those in the pre-war years of 1909–1913.<sup>55</sup> In the light of these figures and available supplementary information, the tentative conclusion may be drawn that canned-pear exports from the United States have probably increased at approximately as fast a rate in the period under discussion as the exports of canned peaches, apricots, and pears.

*British Isles Our Chief Foreign Canned-Pear Market.*—The outstanding importance of the British Isles as a foreign outlet for our canned pears is shown in table 25. Almost 90 per cent of our canned-pear exports have gone to the British Isles in recent years, the proportion varying only from about 84 to 92 per cent. Exports of canned peaches exceeded those of canned pears by about 7 million pounds annually during the years 1923–1926. The British market, however, received about 10 per cent more of the pears than of the peaches. As a result, the average British imports of the two kinds of canned fruit from the United States have been practically equal, averaging approximately 48 million pounds. Imports of canned apricots have been only about half as great as those of pears. Since the Pacific Coast states produce about 90 per cent of the national output of canned pears, the vital dependence of their canned-pear industry upon the English market is indicated by the fact that the British alone have imported and consumed over 40 per cent of the United States canned-pear pack in recent years.

<sup>53</sup> Wentz, R. A. The California canned and dried-fruit industries with special reference to their dependence upon exporting. An unpublished thesis submitted to the University of California as partial fulfillment of the master's degree in 1925, page 26.

<sup>54</sup> Great Britain, Statistical abstract for the United Kingdom, 1910–1924, pp. 90, 91. 1926.

<sup>55</sup> Based on data compiled from Annual Statements of the Trade of the United Kingdom.

TABLE 25  
UNITED STATES CANNED-PEAR EXPORTS BY CHIEF COUNTRIES OF DESTINATION AND BY CUSTOMS DISTRICTS OF ORIGIN, CALENDAR  
YEARS 1922-1926

| Country of destination            | Average, 1922-26            |              | 1926*                       |              | 1925                        |              | 1924                        |              | 1923                        |              | 1922                        |              |
|-----------------------------------|-----------------------------|--------------|-----------------------------|--------------|-----------------------------|--------------|-----------------------------|--------------|-----------------------------|--------------|-----------------------------|--------------|
|                                   | Thou-<br>sands of<br>pounds | Per<br>cent  | Thou-<br>sands of<br>pounds | Per<br>cent  | Thou-<br>sands of<br>pounds | Per<br>cent  | Thou-<br>sands of<br>pounds | Per<br>cent  | Thou-<br>sands of<br>pounds | Per<br>cent  | Thou-<br>sands of<br>pounds | Per<br>cent  |
| British Isles.....                | 47,440                      | 88.9         | 44,635                      | 87.1         | 62,602                      | 90.1         | 53,009                      | 89.6         | 34,247                      | 84.5         | 42,724                      | 91.9         |
| Canada.....                       | 769                         | 1.4          | 971                         | 1.9          | 699                         | 1.0          | 744                         | 1.3          | 810                         | 2.0          | 620                         | 1.3          |
| Cuba.....                         | 2,075                       | 3.9          | 1,431                       | 2.8          | 2,581                       | 3.7          | 2,908                       | 4.9          | 2,812                       | 6.9          | 637                         | 1.4          |
| Other countries.....              | 3,087                       | 5.8          | 4,191                       | 8.2          | 3,576                       | 5.2          | 2,462                       | 4.2          | 2,684                       | 6.6          | 2,511                       | 5.4          |
| <i>Total</i> .....                | <i>53,871</i>               | <i>100.0</i> | <i>61,227</i>               | <i>100.0</i> | <i>69,458</i>               | <i>100.0</i> | <i>69,123</i>               | <i>100.0</i> | <i>40,563</i>               | <i>100.0</i> | <i>46,492</i>               | <i>100.0</i> |
| <i>Origin by Customs district</i> |                             |              |                             |              |                             |              |                             |              |                             |              |                             |              |
| California.....                   | 32,532                      | 60.9         | 26,960                      | 52.7         | 40,827                      | 58.8         | 36,296                      | 61.4         | 28,504                      | 70.3         | 30,074                      | 64.7         |
| Washington.....                   | 9,489                       | 17.7         | 11,713                      | 22.8         | 13,634                      | 19.6         | 9,164                       | 15.5         | 4,513                       | 11.1         | 8,420                       | 18.1         |
| Oregon.....                       | 7,047                       | 13.4         | 8,274                       | 16.1         | 10,080                      | 14.5         | 7,116                       | 12.0         | 4,014                       | 9.9          | 5,753                       | 12.4         |
| Pacific Coast.....                | 49,068                      | 92.0         | 46,947                      | 91.6         | 64,641                      | 92.9         | 62,676                      | 88.9         | 37,031                      | 91.8         | 44,246                      | 96.2         |
| Other districts.....              | 4,302                       | 8.0          | 4,280                       | 8.4          | 4,917                       | 7.1          | 6,547                       | 11.1         | 3,522                       | 8.7          | 2,246                       | 4.8          |

\* Data for 1926 are preliminary and subject to revision.

Sources of data: Exports are in approximate net pounds, exclusive of weight of package and tins. Compiled from annual numbers of Foreign Commerce and Navigation of the United States. The San Francisco and Los Angeles customs districts are given as a total for California.

Cuba and Canada have ranked second and third as importers of our canned pears. The two together have on the average taken only slightly over 5 per cent of our total exports since 1922. All other countries together have taken slightly less than 6 per cent of the total.

The dominant position of United States canned-fruit exports in the United Kingdom is evident from the fact that during the years 1921–1925 approximately 86 per cent of the total British canned-fruit imports (exclusive of pineapples) came from this country. Even when canned pineapples, as well as all other fruits are considered, the United States has contributed almost two-thirds of British canned-fruit imports in recent years. Only about 10 per cent of canned fruits other than pineapples have been imported from British countries. Chief of these is Australia, which contributed about 8 per cent, and is the only country aside from the United States contributing as much as 2 per cent of the total. About four-fifths of British canned-pineapple imports come from the Straits Settlements.<sup>56</sup>

A comparison of the average annual imports of the United Kingdom for the pre-war years 1909–1913 with the five years 1921–1925 shows that the total imports of canned fruits other than pineapples have, during the post-war period, been about four times the pre-war imports; imports from the United States alone about 3.8 times. Although the United States was the source of about 93 per cent of British canned-fruit imports (other than pineapples) before the war, her share in recent years has been reduced to about 86 per cent. This relative decline is almost entirely accounted for by imports from Australia, which were negligible before the war, but which, as already indicated, have in recent years constituted about 8 per cent of British imports of canned fruits other than pineapples.

*Increasing Competition from Australian Canned Fruit.*—The rapid growth of Australian irrigated fruit acreage in the last decade is of special significance to the United States pear industry because it tends to swell the output, and hence the exports, of canned fruit and jams (and incidentally dried fruits). These exports are largely consumed in the British Isles, and compete directly with the major part of our exports of canned pears, apricots, and peaches.

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<sup>56</sup> The vital dependence of the canning industry of the United States upon the British market suggests further study of the volume, sources, and trends of canned-fruit imports into the British Isles and the possibilities of future expansion of our sales in this market. Unfortunately canned-pineapple imports are the only ones for which imports are given separately for individual fruits in British statistics of foreign trade. It is therefore necessary to study British imports of all canned fruits but pineapples, as a group. However, apart from pineapples, British imports of canned fruits chiefly consist of peaches, pears, and apricots.

Data in table 26 indicate that although Australian production of jam, which grew rapidly during the war, has since declined considerably, the output of preserved or canned fruits has shown a tendency to increase since 1918. Table 27 shows that pears have constituted over 20 per cent of the total Australian pack of canned pears, peaches, and apricots in recent years. Judging from table 26, the canned-pear output seems to be increasing, but not as rapidly as that of peaches.

TABLE 26

FACTORY OUTPUT OF CANNED FRUIT AND OF JAMS, MARMALADES, AND JELLIES,  
AUSTRALIA AND UNION OF SOUTH AFRICA IN RECENT YEARS

| Season       | Australia     |                              | Union of South Africa                     |                                       |
|--------------|---------------|------------------------------|-------------------------------------------|---------------------------------------|
|              | Jam<br>pounds | Preserved<br>fruit<br>pounds | Jams, marmalade,<br>and jellies<br>pounds | Canned and<br>bottled fruit<br>pounds |
| 1916-17..... |               |                              | 13,768,000                                | 1,448,000                             |
| 1917-18..... |               |                              | 16,455,424                                | 1,973,789                             |
| 1918-19..... | 135,737,756*  | 33,628,941                   | 18,451,287                                | 2,138,214                             |
| 1919-20..... | 111,322,754   | 47,943,019                   | 18,319,466                                | 2,381,638                             |
| 1920-21..... | 90,140,566*   | 23,866,993                   | 13,774,349                                | 2,693,541                             |
| 1921-22..... | 57,195,815    | 41,847,494                   | 7,878,346                                 | 4,237,002                             |
| 1922-23..... | 66,971,456    | 44,439,968                   | 12,535,020                                | 3,950,808                             |
| 1923-24..... | 66,283,840    | 49,978,003                   | 14,467,215                                | 3,668,324                             |
| 1924-25..... | 64,657,052*   | 65,874,977                   |                                           |                                       |
| 1925-26..... |               |                              |                                           |                                       |
| 1926-27..... |               |                              |                                           |                                       |

\* Exclusive of Western Australia.

Data for Australia from: Commonwealth of Australia, Bur. of Census and Statistics. Summary of Australian Production Statistics 1914-15 to 1924-25. Production Bul. 19: 161. [C.S. No. 494.] 1926. Data for South Africa from Union of South Africa, Office of Census and Statistics. Statistics of Production, 1923-24: 69. 1926.

TABLE 27

AUSTRALIAN CANNED PACK OF PEACHES, PEARS, AND APRICOTS,  
1922-23 to 1925-26\*

| Kind of fruit           | Average 1922-23<br>through 1925-26 |                      | 1922-23<br>cases | 1923-24<br>cases | 1924-25<br>cases | 1925-26<br>cases |
|-------------------------|------------------------------------|----------------------|------------------|------------------|------------------|------------------|
|                         | Cases                              | Per cent<br>of total |                  |                  |                  |                  |
| Apricots.....           | 151,367                            | 14.9                 | 122,622          | 140,597          | 206,575          | 135,675          |
| Pears.....              | 218,390                            | 21.5                 | 137,386          | 255,173          | 272,528          | 208,475          |
| Freestone peaches.....  | 57,005                             | 5.6                  | 46,744           | 67,704           | 93,899           | 19,673           |
| Clingstone peaches..... | 588,653                            | 58.0                 | 477,792          | 490,461          | 627,357          | 758,999          |
| Total.....              | 1,015,415                          | 100.0                | 784,544          | 953,935          | 1,200,359        | 1,122,822        |

\* In cases of 24 tins each.

Sources of data: Based on data given in dozen tins as reported by American Trade Commissioner E. G. Babbitt, Sydney, Australia in U. S. Dept. Commerce Foodstuffs 'Round the World: Canned and Dried Foods (mimeo.) p. 1. Feb. 11, 1927.

TABLE 28  
BEARING AND NON-BEARING FRUIT TREES BY KINDS ON FARMS IN AUSTRALIA, 1918-19 AND 1924-25

| Kind            | 1924-25 |             |                     |         | Difference between bearing 1924-25 and bearing 1918-19 |                                 | 1918-19 |             | Production average 1922-23-1924-25 |                     |      |
|-----------------|---------|-------------|---------------------|---------|--------------------------------------------------------|---------------------------------|---------|-------------|------------------------------------|---------------------|------|
|                 | Bearing | Non-bearing |                     | Total   | Acres                                                  | Per cent of non-bearing 1918-19 | Bearing | Non-bearing | Acres                              | Per cent of bearing |      |
|                 |         | Acres       | Per cent of bearing |         |                                                        |                                 |         |             |                                    |                     |      |
|                 |         |             |                     |         |                                                        |                                 |         |             |                                    |                     |      |
| Apples.....     | 81,916  | 17,267      | 21                  | 99,183  | 9,851                                                  | 34                              | 72,065  | 29,211      | 6,560,029                          | 57.3                |      |
| Apricots.....   | 10,739  | 3,004       | 21                  | 13,743  | 1,950                                                  | 55                              | 8,789   | 3,549       | 40                                 | 486,546             | 4.2  |
| Nectarines..... | 827     | 175         | 21                  | 1,002   | —189                                                   | .....                           | 1,016   | 248         | 41                                 | 66,867              | 0.6  |
| Peaches.....    | 21,895  | 5,090       | 23                  | 26,985  | 815                                                    | 11                              | 21,080  | 7,439       | 28                                 | 2,032,517           | 17.7 |
| Pears.....      | 17,039  | 5,479       | 32                  | 22,518  | 3,230                                                  | 38                              | 13,809  | 8,456       | 61                                 | 1,493,216           | 13.0 |
| Plums.....      | 12,482  | 6,234       | 50                  | 18,716  | 2,924                                                  | 64                              | 9,558   | 4,546       | 47                                 | 812,942             | 7.1  |
| Total.....      | 144,898 | 37,249      | 26                  | 182,147 | 18,581                                                 | 35                              | 126,317 | 53,449      | 42                                 | 11,452,117          | 99.9 |

Source: Summary of Australian Production Statistics for years 1914-15 to 1924-25, Commonwealth Bur. of Census and Statistics Bul. 19.22. 1926.

Since the population of Australia will probably not increase greatly in the next few years and the canned-fruit industry has been on an export basis for several years, any appreciable expansion of the canned-fruit output will probably result in an increase of exports, the majority of which compete with those from the United States on the English market.

Table 28 shows the striking growth of Australian deciduous tree-fruit acreage in the six years from 1918-1919 to 1924-1925 and also indicates the probability of considerable further expansion in the next few years. The production of pears in recent years has been nearly as large as that of Oregon, and the bearing acreage is about 30 per cent greater. The probability of a substantial increase in the bearing acreage and production of pears, and of other deciduous tree fruits as well, is indicated by the substantial proportion of trees which were not of bearing age in 1925. The fact that Australian fruit exports are largely in canned or dried form would lead one to expect a continued expansion of such imports in the next few years. The very limited demand for dried pears at remunerative prices suggests the possibility of a more pronounced increase in the canned-pear output than in that of dried pears.

As yet the Union of South Africa exports but a small quantity of canned fruit. These exports are gradually increasing, however, and the trend of fruit plantings indicates that in another generation her canned-fruit exports may become large enough to decidedly influence the British market for our canned fruit.<sup>57</sup>

#### DRIED PEARS<sup>58</sup>

*Dried Pears Relatively Unimportant.*—The output of dried pears in the United States is of relatively little commercial importance. Although the Federal Census Bureau has never published the output of dried pears separately, it is generally known that California is the only state in the Union which dries pears commercially in any appreciable quantities. The dried-pear output of this state, however, is relatively unimportant in comparison with either the total pear crop of the state or the total output of all dried fruits, and has not kept pace with either in the last twenty years. The average annual dried output for 1910-1914 of about 1,450 tons utilized nearly 14 per cent

<sup>57</sup> See table 26 for the factory output of canned fruit in recent years.

<sup>58</sup> A brief discussion of the dried-pear industry of California may be found in: Weldon, G. P. Pear growing in California. California State Com. Hort. Monthly Bul. 7: 394-399. 1918; and also in: Stokes, F. G. The dried pear industry. California State Com. Hort. Monthly Bul. 6: 121-125. 1917.

of the commercial pear crop; the average of about 3,600 tons during the five years 1922–1926, only about 12 per cent. (See figure 26, page 88, and table 31, page 102.) This dried tonnage of pears is considerably less than 1 per cent of the average commercial output of all dried fruits in California in recent years.

The dried-pear industry has for a good many years been more important in Lake County than in any other section of California. The fact that most of the pear orchards of Lake County are about 30 miles from a railroad shipping point has resulted in the drying of much fruit of good quality. In pear-producing sections conveniently close to rail transportation, in other sections of the state, the good pears are usually packed or sold to the canneries; those dried are mostly culls. The superior quality of much of the dried-pear output of Lake County has in the past resulted in considerably higher prices for these dried pears than for those from other sections of the state. With the greatly increased use of motor trucks in the last few years, a larger proportion of Lake County pears have been canned or shipped to eastern markets than formerly. The dried output is, however, still considerable.

*Great Fluctuations in Dried-Pear Output.*—The proportion of the commercial pear crop of California which is dried, and the actual tonnage, varies greatly from year to year. In 1922 about 20 per cent of the commercial crop was dried, but only 8 per cent in 1923. The dried tonnage of pears in 1922 was 5,000 and in 1923 only 2,000. These great ups and downs in the dried output are to a considerable extent due to the fact that the dried-pear output is determined by what is left to dry after growers have decided how much they will ship east and the canners how much they will put in cans. The close relationship which the dried-pear pack bears to the total tonnage of pears produced in the state is indicated by the fact that in fourteen of the last seventeen years, the tonnage dried increased or decreased in the same direction as total production.

*Europeans Are Chief Consumers.*—Europe has long been the chief market for our dried pears, the majority of which are exported thereto.<sup>59</sup> It is claimed that even in the United States most of the usual quality of dried pears is consumed by European immigrants who have cultivated a taste for them and know how to prepare them in an appetizing manner. Foreign peoples are said to prefer the dried pear stewed with other fruits as a fruit salad.<sup>60</sup> Most Americans

<sup>59</sup> Weldon, G. P. Pear growing in California. California State Com. Hort. Monthly Bul. 7: 395. 1918; and Kieffer, D. L. King Bartlett of Lake County. Pacific Rural Press 98: 291. 1919.

<sup>60</sup> Swett, F. T. in California Pear Grower 3 (1): 5. 1923.

apparently do not know how to cook dried pears in as appetizing a way as many foreigners do. We also have numerous other dried fruits to choose from for which we have already acquired a taste and hence it is a serious question whether any considerable increase in the demand for dried pears can be economically stimulated in this country in the near future.

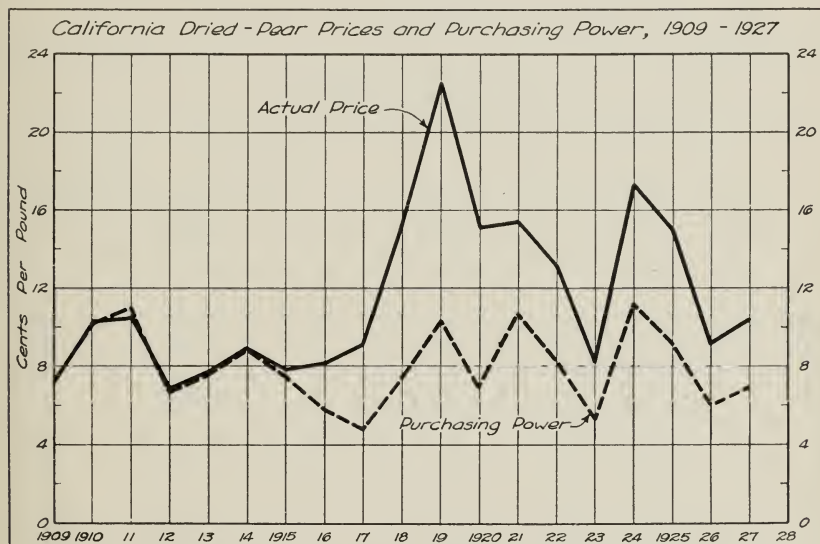


Fig. 28.—Dried-pear prices fluctuate considerably from year to year. The trend of purchasing power per ton since 1910 has been approximately on a level.

(Data from table 29.)

*Dried-Pear Purchasing Power, 1909–1927.*—The prices and purchasing power of California dried pears shown in figure 28 and table 29 do not represent prices to growers, but are a simple average of packers quotations on northern choice dried pears at wholesale, f.o.b. California, for July through December each year. These data, however, in the absence of prices to growers, are useful indicators of the probable trend and relative changes in the price and purchasing power of dried pears, other than fancy Lake County pears, since 1910. Figure 29 shows that both the price and purchasing power of dried pears fluctuates considerably from year to year. A comparison of the changes in the purchasing power of dried pears and the production of all pears and of dried pears in California from year to year since 1909 shows no apparent tendency for prices either to rise and fall with production or in the opposite direction. The trend of purchasing power since 1909 has been approximately on a level.

## APPENDIX OF TABLES

TABLE 29

CALIFORNIA DRIED PEAR PRICE AND PURCHASING POWER, PACKERS' QUOTATIONS  
F.O.B. CALIFORNIA, 1909-1927

| Crop year            | Price         |                                   | Purchasing power |                                   | All-commodity<br>wholesale-price<br>index<br>(July-Dec.) |
|----------------------|---------------|-----------------------------------|------------------|-----------------------------------|----------------------------------------------------------|
|                      | Cents per lb. | Per cent<br>of 1910-14<br>average | Cents per lb.    | Per cent<br>of 1910-14<br>average |                                                          |
|                      | 1             | 2                                 | 3                | 4                                 |                                                          |
| 1910-14 average..... | 8.8           | 100                               | 8.8              | 100                               | 100                                                      |
| 1909.....            | 7.1           | 81                                | 7.1              | 80                                | 101                                                      |
| 1910.....            | 10.3          | 117                               | 10.1             | 115                               | 102                                                      |
| 1911.....            | 10.5          | 118                               | 11.0             | 125                               | 95                                                       |
| 1912.....            | 6.8           | 77                                | 6.7              | 76                                | 102                                                      |
| 1913.....            | 7.7           | 87                                | 7.5              | 85                                | 102                                                      |
| 1914.....            | 8.9           | 100                               | 8.8              | 99                                | 101                                                      |
| 1915.....            | 7.8           | 88                                | 7.5              | 85                                | 104                                                      |
| 1916.....            | 8.1           | 91                                | 5.8              | 66                                | 138                                                      |
| 1917.....            | 9.1           | 103                               | 4.8              | 55                                | 189                                                      |
| 1918.....            | 15.2          | 173                               | 7.4              | 84                                | 205                                                      |
| 1919.....            | 22.5          | 254                               | 10.3             | 116                               | 219                                                      |
| 1920.....            | 15.1          | 171                               | 6.9              | 79                                | 218                                                      |
| 1921.....            | 15.4          | 175                               | 10.7             | 122                               | 144                                                      |
| 1922.....            | 13.1          | 149                               | 8.3              | 94                                | 158                                                      |
| 1923.....            | 8.2           | 93                                | 5.2              | 60                                | 155                                                      |
| 1924.....            | 17.3          | 196                               | 11.2             | 127                               | 154                                                      |
| 1925.....            | 14.9          | 169                               | 9.2              | 105                               | 161                                                      |
| 1926.....            | 9.1           | 103                               | 6.0              | 68                                | 152                                                      |
| 1927.....            | 10.4          | 118                               | 6.9              | 78                                | 150                                                      |
| 1928.....            |               |                                   |                  |                                   |                                                          |

Sources of data:

Col. 1.—A simple or unweighted average of the weekly average of the range in packers' quotations f. o. b. California for "Northern," "choice" dried pears per pound in 25-lb. boxes unfaced for each season from the first quotations of the season through the last in December. Compiled from the California Fruit News.

Col. 3.—Estimated approximate purchasing power per pound is calculated by dividing items in col. 1 by the corresponding items in col. 5 and multiplying by 100.

Col. 5.—U. S. Bureau of Labor Statistics all-commodity wholesale-price index for the United States converted to a 1910-1914 base of 100, average for the months July through December which period corresponds approximately to those upon which the average prices in col. 1 were based.

TABLE 30  
UNITED STATES PEAR PRODUCTION BY CHIEF STATES AND GROUPS, 1917-1927

| State or group    | 1924-1926 average |                                 |                                                        | 1919-1921 average               |                                                        |                                                        | Production in thousands of bushels |        |        |        |        |        |        |        |        |        |        |        |
|-------------------|-------------------|---------------------------------|--------------------------------------------------------|---------------------------------|--------------------------------------------------------|--------------------------------------------------------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                   | Rank              | Thou-<br>sands<br>of<br>bushels | Per<br>cent of<br>U. S.<br>1919-21<br>total<br>average | Thou-<br>sands<br>of<br>bushels | Per<br>cent of<br>U. S.<br>1919-14<br>total<br>average | Per<br>cent of<br>U. S.<br>1910-14<br>total<br>average | 1917                               | 1918   | 1919   | 1920   | 1921   | 1922   | 1923   | 1924   | 1925   | 1926   | 1927*  | 1928   |
| California.....   | 1                 | 7,236                           | 33.4                                                   | 180                             | 4,083                                                  | 28.4                                                   | 162                                | 3,665  | 4,240  | 4,600  | 4,080  | 3,570  | 6,250  | 5,542  | 5,542  | 7,542  | 8,625  | 7,333  |
| Washington.....   | 2                 | 2,423                           | 11.1                                                   | 157                             | 1,544                                                  | 10.7                                                   | 344                                | 1,000  | 1,300  | 1,781  | 1,140  | 1,710  | 1,740  | 2,700  | 1,750  | 2,300  | 3,220  | 1,578  |
| New York.....     | 3                 | 2,411                           | 11.1                                                   | 117                             | 2,060                                                  | 14.3                                                   | 131                                | 1,708  | 1,352  | 1,830  | 2,700  | 1,650  | 3,200  | 1,000  | 2,100  | 3,045  | 2,088  | 1,872  |
| Oregon.....       | 4                 | 1,608                           | 7.4                                                    | 205                             | 786                                                    | 5.5                                                    | 149                                | 600    | 672    | 761    | 760    | 836    | 1,400  | 1,580  | 1,225  | 1,500  | 2,100  | 1,900  |
| Michigan.....     | 5                 | 716                             | 3.3                                                    | 108                             | 660                                                    | 4.6                                                    | 98                                 | 1,080  | 704    | 405    | 1,044  | 532    | 1,500  | 1,005  | 810    | 450    | 889    | 702    |
| Illinois.....     | 6                 | 619                             | 2.8                                                    | 172                             | 359                                                    | 2.5                                                    | 98                                 | 456    | 302    | 375    | 603    | 100    | 510    | 307    | 500    | 540    | 818    | 312    |
| Pennsylvania..... | 7                 | 615                             | 2.8                                                    | 124                             | 495                                                    | 3.4                                                    | 92                                 | 448    | 518    | 421    | 845    | 220    | 576    | 612    | 629    | 468    | 748    | 400    |
| New Jersey.....   | 8                 | 594                             | 2.7                                                    | 139                             | 426                                                    | 3.0                                                    | 52                                 | 590    | 650    | 402    | 690    | 185    | 405    | 662    | 624    | 512    | 645    | 420    |
| Colorado.....     | 9                 | 541                             | 2.5                                                    | 132                             | 411                                                    | 2.9                                                    | 254                                | 320    | 194    | 345    | 386    | 502    | 519    | 400    | 550    | 510    | 564    | 480    |
| Texas.....        | 10                | 483                             | 2.2                                                    | 105                             | 460                                                    | 3.2                                                    | 205                                | 280    | 246    | 637    | 338    | 406    | 390    | 340    | 483    | 386    | 580    | 345    |
| Missouri.....     | 11                | 397                             | 1.8                                                    | 140                             | 284                                                    | 2.0                                                    | 140                                | 265    | 112    | 431    | 418    | 4      | 450    | 475    | 375    | 342    | 473    | 270    |
| Ohio.....         | 12                | 370                             | 1.7                                                    | 146                             | 254                                                    | 1.8                                                    | 48                                 | 334    | 304    | 157    | 478    | 126    | 450    | 332    | 326    | 354    | 430    | 250    |
| Maryland.....     | 13                | 336                             | 1.5                                                    | 135                             | 248                                                    | 1.7                                                    | 50                                 | 525    | 455    | 287    | 421    | 35     | 256    | 374    | 335    | 280    | 394    | 193    |
| Virginia.....     | 14                | 325                             | 1.5                                                    | 129                             | 252                                                    | 1.8                                                    | 136                                | 194    | 119    | 288    | 438    | 30     | 270    | 200    | 430    | 135    | 410    | 130    |
| Delaware.....     | 15                | 299                             | 1.4                                                    | 365                             | 82                                                     | 0.6                                                    | 35                                 | 294    | 238    | 98     | 140    | 9      | 158    | 374    | 328    | 180    | 388    | 128    |
| Indiana.....      | 16                | 239                             | 1.1                                                    | 130                             | 184                                                    | 1.3                                                    | 41                                 | 410    | 260    | 107    | 375    | 70     | 300    | 334    | 180    | 209    | 328    | 140    |
| Utah.....         | 30                | 58                              | 0.3                                                    | 72                              | 81                                                     | 0.6                                                    | 169                                | 48     | 51     | 76     | 87     | 81     | 98     | 64     | 70     | 25     | 80     | 60     |
| Group—A.....      |                   | 19,272                          | 89.2                                                   | 153.0                           | 12,669                                                 | 88.3                                                   | 126.8                              | 12,217 | 11,717 | 13,001 | 14,943 | 10,066 | 18,472 | 16,301 | 16,257 | 18,778 | 22,780 | 16,513 |
| B.....            |                   | 2,340                           | 10.8                                                   | 138.3                           | 1,700                                                  | 11.7                                                   | 92.3                               | 1,611  | 1,645  | 2,005  | 1,862  | 1,231  | 2,233  | 1,544  | 2,609  | 1,942  | 2,469  | 1,559  |
| C.....            |                   | 15,554                          | 72.1                                                   | 158.4                           | 9,903                                                  | 68.9                                                   | 157.9                              | 8,829  | 8,764  | 10,097 | 10,713 | 8,900  | 15,119 | 12,534 | 12,477 | 15,887 | 18,304 | 14,177 |
| D.....            |                   | 11,267                          | 52.4                                                   | 177.5                           | 6,413                                                  | 44.6                                                   | 183.3                              | 5,265  | 6,212  | 7,142  | 5,980  | 6,116  | 9,390  | 9,822  | 8,517  | 11,342 | 13,945 | 10,811 |
| E.....            |                   | 10,345                          | 47.6                                                   | 130.0                           | 7,966                                                  | 55.4                                                   | 95.4                               | 8,563  | 7,150  | 7,864  | 10,825 | 5,181  | 11,315 | 8,023  | 10,349 | 9,378  | 11,304 | 7,261  |
| F.....            |                   | 4,031                           | 18.5                                                   | 173.0                           | 2,330                                                  | 16.2                                                   | 233.2                              | 1,600  | 1,972  | 2,542  | 1,900  | 2,546  | 3,140  | 4,280  | 2,975  | 3,800  | 5,320  | 3,478  |
| Total U. S.....   |                   | 21,612                          | 100.0                                                  | 151.3                           | 14,369                                                 | 100.0                                                  | 121.3                              | 13,828 | 13,362 | 15,006 | 16,805 | 11,297 | 20,705 | 17,845 | 18,866 | 20,720 | 25,249 | 18,072 |

\* Data for 1927 are preliminary and subject to revision.

† The states included in the group totals listed above are as follows:

A—Total of 17 states listed separately in the table;

B—Total of all other states;

C—Total of the seven chief pear shipping states—California, Washington, New York, Oregon, Michigan, Illinois, and Colorado;

D—Total for the Pacific Coast states—California, Washington, and Oregon;

E—United States total minus the Pacific Coast states in group D;

F—Total of two Pacific-northwest states—Washington and Oregon.

Sources of Data: Data for years 1909-1918 for all states except California from Gould, H. P. and Frank Andrews, Pears: Production Estimates and Important Commercial Districts and Varieties. U. S. Dept. Agr. Bul. 822: 2, 3. 1920: California data for 1909-1918 from table 5, page 27; all data for years 1919-1925 from U. S. Dept. Agr. Yearbook 1926: 916. 1927; and for years 1926-1927 from Crops and Markets 4: 466. Dec. 1927.

TABLE 31  
COMMERCIAL OUTPUT OF CALIFORNIA PEARS BY CHIEF USES, 1906-1927

| Year     | Total commercial output  |          |        | Fresh interstate shipments north of Tehachapi |                   |           | Canned           |                   |        | Dried            |                   |
|----------|--------------------------|----------|--------|-----------------------------------------------|-------------------|-----------|------------------|-------------------|--------|------------------|-------------------|
|          | Bushels<br>(000 omitted) | Tons     | Cars   | Fresh equivalent                              |                   | Cases     | Fresh equivalent |                   | Tons   | Fresh equivalent |                   |
|          |                          |          |        | Tons                                          | Per cent of total |           | Tons             | Per cent of total |        | Tons             | Per cent of total |
| 1        | 2                        | 3        | 4      | 5                                             | 6                 | 7         | 8                | 9                 | 10     | 11               | 12                |
| 1906     | 1,640                    | 41,011   | 1,513  | 16,643                                        | 40.6              | 612,500   | 16,118           | 39.3              | 1,500  | 8,250            | 20.1              |
| 1907     | 1,171                    | 29,276   | 1,039  | 11,429                                        | 39.0              | 573,700   | 15,097           | 51.6              | 500    | 2,750            | 9.4               |
| 1908     | 2,444                    | 61,093   | 2,702  | 29,722                                        | 48.6              | 669,600   | 17,621           | 28.8              | 2,500  | 13,750           | 22.8              |
| 1909     | 1,900                    | 50,007   | 2,638  | 29,018                                        | 58.0              | 536,350   | 14,114           | 28.2              | 1,250  | 6,875            | 13.8              |
| 1910     | 1,965                    | 49,118   | 2,361  | 25,971                                        | 52.9              | 670,585   | 17,647           | 35.9              | 1,000  | 5,500            | 11.2              |
| 1911     | 2,249                    | 56,213   | 2,325  | 27,900                                        | 49.6              | 617,880   | 17,313           | 30.8              | 2,000  | 11,000           | 19.6              |
| 1912     | 2,854                    | 71,352   | 3,135  | 37,620                                        | 52.7              | 916,050   | 24,107           | 33.8              | 1,750  | 9,625            | 13.5              |
| 1913     | 2,020                    | 50,488   | 2,496  | 29,952                                        | 59.3              | 571,350   | 15,036           | 29.8              | 1,000  | 5,500            | 10.9              |
| 1914     | 2,545                    | 63,636   | 2,725  | 32,700                                        | 51.4              | 862,055   | 22,686           | 35.6              | 1,500  | 8,250            | 13.0              |
| 1915     | 3,361                    | 80,592   | 3,646  | 31,752                                        | 53.8              | 827,630   | 21,780           | 36.9              | 1,000  | 5,500            | 9.3               |
| 1916     | 3,040                    | 75,991   | 3,701  | 44,412                                        | 58.4              | 1,032,810 | 27,179           | 35.8              | 800    | 4,400            | 5.8               |
| 1917     | 3,345                    | 83,625   | 4,802  | 57,624                                        | 68.9              | 758,142   | 19,951           | 23.9              | 1,100  | 6,050            | 7.2               |
| 1918     | 3,269                    | 81,719   | 4,571  | 54,852                                        | 67.1              | 811,950   | 21,367           | 26.1              | 1,000  | 5,500            | 6.8               |
| 1919     | 4,167                    | 103,929  | 4,948  | 50,976                                        | 49.0              | 1,071,687 | 28,203           | 27.2              | 1,000  | 5,500            | 23.8              |
| 1920     | 3,948                    | 98,708   | 4,391  | 52,692                                        | 53.4              | 1,184,288 | 31,166           | 31.6              | 2,700  | 14,850           | 15.0              |
| 1921     | 3,184                    | 79,598   | 4,170  | 50,040                                        | 62.8              | 1,712,733 | 22,958           | 28.9              | 1,200  | 6,600            | 8.3               |
| 1922     | 5,603                    | 140,072  | 5,625  | 67,500                                        | 48.0              | 1,712,733 | 45,072           | 32.2              | 5,000  | 27,500           | 19.8              |
| 1923     | 5,020                    | 125,505  | 6,913  | 82,956                                        | 66.3              | 1,181,565 | 31,094           | 24.9              | 2,000  | 11,000           | 8.8               |
| 1924     | 4,957                    | 123,934  | 6,916  | 68,592                                        | 55.3              | 1,444,623 | 38,017           | 30.7              | 3,150  | 17,325           | 14.0              |
| 1925     | 6,899                    | 172,467  | 7,660  | 98,280                                        | 53.4              | 2,313,800 | 60,937           | 35.4              | 3,500  | 19,250           | 11.2              |
| 1926     | 7,835                    | 195,873  | 9,800  | 118,680                                       | 60.6              | 2,044,114 | 53,801           | 27.3              | 4,253  | 23,302           | 11.9              |
| 1927     | 6,579*                   | 164,484* | 8,100* | 97,200*                                       | 59.2              | 1,929,805 | 50,784           | 30.8              | 3,000* | 16,500*          | 10.0              |
| 1928     |                          |          |        |                                               |                   |           |                  |                   |        |                  |                   |
| Averages |                          |          |        |                                               |                   |           |                  |                   |        |                  |                   |
| 1914-14  | 2,386                    | 58,161   | 2,608  | 30,829                                        | 53.0              | 735,584   | 19,367           | 33.3              | 1,450  | 7,975            | 13.7              |
| 1922-26  | 6,063                    | 151,570  | 7,167  | 86,004                                        | 56.7              | 1,739,787 | 45,784           | 30.3              | 3,681  | 19,683           | 13.0              |
| 1924-26  | 6,564                    | 164,091  | 7,765  | 93,186                                        | 56.7              | 1,934,879 | 50,918           | 31.1              | 3,634  | 19,989           | 12.2              |

\* Data on shipments for 1927 are preliminary and those on dried output are rough estimates only.

Sources of data:

Col. 2.—Tons in col. 3 converted to approximate number of bushels at 50 lbs. to the bushel.

Col. 3.—Sum of items for corresponding year in cols. 5, 8, and 11.

Col. 4.—Carloads in col. 4 converted to approximate net tons on the basis of a minimum carload weight of 11 tons net (or 12 tons gross) for '1906-1910 and 12 tons net (or 13 tons gross) for 1911-1926.

Col. 5.—Cases of pears canned in California as given are a total of the number of cases of tins of all sizes except that No. 10 tins (gallons) for '1906-1910 and 12 tons on the basis of 6 cans per case. Official data of the Canners' League of California. Compiled from California Fruit News.

Col. 6.—Number of cases in col. 7 divided by 38, the approximate average number of cases of pears in No. 2½ tins canned from a ton of fresh pears.

Col. 7.—Years 1906-1910 from Robertson, Geo. Statistical summary of the production and resources of California. California State Board Agr. Report 1911: 165; except data for 1906 revised by author because Robertson's figure was too large in comparison with "various other" dried fruits (pears, pitted plums, nectarines, and grapes) as estimated by the California Fruit Grower (now the California Fruit News). Years 1911-1919 from estimates of Geo. Robertson in California State Board of Agr. Statistical report for 1919: 142. Years 1920-1928 compiled from California Fruit News, estimates by the editor for years 1920-1923 and by the Dried Fruit Association of California for years 1924-1926.

Col. 8.—Number of cases in col. 7 multiplied by 5.5.

Col. 9.—Dried tons in col. 10 multiplied by 5.5.

TABLE 32

UNITED STATES CARLOT SHIPMENTS OF PEARS BY CHIEF STATES AND GROUPS,  
CROP YEARS 1917-1926

| State or group    | Average 1924-1926 |                      |                           |                       |                              | Average 1919-1921 |                      |                           |                       |
|-------------------|-------------------|----------------------|---------------------------|-----------------------|------------------------------|-------------------|----------------------|---------------------------|-----------------------|
|                   | Cars              | Thousands of bushels | Percent of U.S. shipments | Percent of production | Percent of 1919-1921 average | Cars              | Thousands of bushels | Percent of U.S. shipments | Percent of production |
| California.....   | 8,900             | 4,450                | 42.6                      | 62                    | 188                          | 4,672             | 2,336                | 35.1                      | 57.2                  |
| New York.....     | 3,249             | 1,625                | 15.5                      | 67                    | 118                          | 2,793             | 1,396                | 21.0                      | 67.8                  |
| Washington.....   | 3,763             | 1,882                | 18.0                      | 78                    | 154                          | 2,419             | 1,209                | 18.1                      | 78.2                  |
| Oregon.....       | 2,203             | 1,102                | 10.5                      | 68                    | 224                          | 974               | 487                  | 7.3                       | 61.9                  |
| Colorado.....     | 807               | 404                  | 3.9                       | 75                    | 126                          | 641               | 320                  | 4.8                       | 78.1                  |
| Illinois.....     | 689               | 345                  | 3.3                       | 56                    | 133                          | 512               | 256                  | 3.8                       | 71.3                  |
| Michigan.....     | 334               | 167                  | 1.6                       | 23                    | 48                           | 681               | 341                  | 5.1                       | 51.6                  |
| Delaware.....     | 217               | 108                  | 1.0                       | 36                    | 185                          | 115               | 57                   | 0.9                       | 70.7                  |
| Texas.....        | 131               | 65                   | 0.6                       | 13                    | 119                          | 104               | 52                   | 0.8                       | 11.3                  |
| Utah.....         | 62                | 31                   | 0.3                       | 53                    | 127                          | 49                | 25                   | 0.3                       | 30.8                  |
| Ohio.....         | 70                | 35                   | 0.3                       | 9                     | 210                          | 29                | 15                   | 0.2                       | 5.9                   |
| Missouri.....     | 75                | 37                   | 0.4                       | 9                     | 164                          | 36                | 18                   | 0.3                       | 6.3                   |
| Indiana.....      | 55                | 28                   | 0.3                       | 12                    | 135                          | 40                | 20                   | 0.3                       | 10.9                  |
| New Jersey.....   | 53                | 26                   | 0.2                       | 4                     | 67                           | 73                | 37                   | 0.5                       | 8.7                   |
| Maryland.....     | 31                | 15                   | 0.2                       | 3                     | 132                          | 25                | 13                   | 0.2                       | 5.2                   |
| Pennsylvania..... | 25                | 12                   | 0.1                       | 2                     | 209                          | 11                | 6                    | 0.1                       | 1.2                   |
| Virginia.....     | 16                | 8                    | 0.1                       | 2                     | 130                          | 10                | 5                    | 0.1                       | 2.0                   |
| Group†—A.....     | 20,680            | 10,340               | 98.9                      | 52.8                  | 155                          | 13,183            | 6,593                | 98.9                      | 52.1                  |
| B.....            | 218               | 109                  | 1.1                       | 5.1                   | 168                          | 146               | 72                   | 1.1                       | 4.2                   |
| C.....            | 19,945            | 9,974                | 95.5                      | 63.1                  | 156                          | 12,692            | 6,345                | 95.2                      | 64.2                  |
| D.....            | 14,866            | 7,433                | 70.8                      | 64.5                  | 182                          | 8,065             | 4,032                | 60.5                      | 62.9                  |
| E.....            | 6,032             | 3,016                | 29.2                      | 29.2                  | 113                          | 5,264             | 2,633                | 39.5                      | 33.0                  |
| F.....            | 5,966             | 2,984                | 28.4                      | 73.2                  | 173                          | 3,393             | 1,696                | 25.4                      | 72.7                  |
| Total U. S.....   | 20,898            | 10,449               | 100.0                     | 47.7                  | 155                          | 13,329            | 6,665                | 100.0                     | 46.4                  |

| State and group   | Shipments in carlots |        |        |        |        |        |        |        |        |        |        |
|-------------------|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                   | 1917                 | 1918   | 1919   | 1920   | 1921   | 1922   | 1923   | 1924   | 1925   | 1926   | 1927*  |
| California.....   | 5,000                | 4,800  | 4,500  | 5,016  | 4,500  | 6,465  | 7,143  | 6,312  | 8,718  | 11,671 | 8,990  |
| New York.....     | 1,746                | 1,226  | 1,506  | 3,979  | 2,893  | 5,461  | 1,701  | 2,978  | 4,510  | 2,258  | 1,681  |
| Washington.....   | 1,700                | 2,421  | 2,452  | 1,902  | 2,903  | 2,678  | 4,274  | 2,456  | 3,560  | 5,274  | 2,297  |
| Oregon.....       | 699                  | 799    | 930    | 1,006  | 985    | 1,862  | 2,575  | 1,483  | 2,225  | 2,902  | 2,762  |
| Colorado.....     | 382                  | 347    | 524    | 654    | 745    | 774    | 696    | 955    | 717    | 750    | 743    |
| Illinois.....     | 334                  | 97     | 324    | 1,179  | 33     | 468    | 318    | 595    | 614    | 858    | 227    |
| Michigan.....     | 696                  | 343    | 127    | 1,264  | 653    | 1,860  | 543    | 394    | 151    | 457    | 503    |
| Delaware.....     | 461                  | 413    | 55     | 290    | 0      | 151    | 541    | 273    | 128    | 249    | 40     |
| Texas.....        | 18                   | 127    | 100    | 98     | 115    | 50     | 99     | 129    | 121    | 144    | 204    |
| Utah.....         | 27                   | 34     | 25     | 88     | 33     | 82     | 65     | 81     | 29     | 77     | 34     |
| Ohio.....         | 29                   | 47     | 5      | 64     | 17     | 96     | 33     | 47     | 62     | 100    | 110    |
| Missouri.....     | 28                   | 0      | 73     | 36     | 0      | 36     | 140    | 55     | 67     | 102    | 35     |
| Indiana.....      | 45                   | 11     | 49     | 71     | 0      | 44     | 39     | 61     | 59     | 44     | 36     |
| New Jersey.....   | 62                   | 52     | 121    | 74     | 23     | 40     | 76     | 60     | 52     | 46     | 18     |
| Maryland.....     | 54                   | 43     | 18     | 54     | 3      | 36     | 63     | 30     | 29     | 33     | 28     |
| Pennsylvania..... | 30                   | 4      | 6      | 28     | 0      | 6      | 48     | 38     | 11     | 26     | 5      |
| Virginia.....     | 16                   | 2      | 0      | 25     | 4      | 2      | 15     | 30     | 4      | 13     | 6      |
| Group†—A.....     | 11,327               | 10,766 | 10,815 | 15,828 | 12,907 | 20,111 | 18,369 | 15,977 | 21,057 | 25,004 | 17,719 |
| B.....            | 96                   | 202    | 178    | 113    | 146    | 270    | 220    | 269    | 200    | 186    | 184    |
| C.....            | 10,557               | 10,033 | 10,363 | 15,000 | 12,712 | 19,568 | 17,250 | 15,175 | 20,495 | 24,170 | 17,203 |
| D.....            | 7,399                | 8,020  | 7,882  | 7,924  | 8,388  | 11,005 | 13,992 | 10,251 | 14,503 | 19,847 | 14,049 |
| E.....            | 4,024                | 2,948  | 3,111  | 8,017  | 4,665  | 9,376  | 4,597  | 5,995  | 6,754  | 5,343  | 3,670  |
| F.....            | 2,399                | 3,220  | 3,382  | 2,908  | 3,888  | 4,540  | 6,849  | 3,939  | 5,785  | 8,176  | 5,059  |
| Total U. S.....   | 11,423               | 10,968 | 10,993 | 15,941 | 13,053 | 20,381 | 18,589 | 16,246 | 21,257 | 25,190 | 17,903 |

\* Data for 1927 are preliminary and subject to revision.

† The states included in the group totals listed above are as follows:

A—Total of 17 states listed separately in the table;

B—Total of all other states;

C—Total of the seven chief pear-shipping states: California, Washington, New York, Oregon, Michigan, Illinois, and Colorado;

D—Total for the Pacific Coast states: California, Washington, and Oregon;

E—United States total minus the Pacific Coast states in group D;

F—Total of two Pacific-northwest states: Washington and Oregon.

(See bottom next page for footnote to table 32 continued.)

TABLE 33

CARLOT SHIPMENTS OF CALIFORNIA PEARS BY COUNTIES AND DISTRICTS,  
CALENDAR YEARS 1920-1926

| County and district                     | 1920  | 1921  | 1922  | 1923  | 1924  | 1925  | 1926*  | Average 1924-26 |                   |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|--------|-----------------|-------------------|
|                                         | Cars  | Cars  | Cars  | Cars  | Cars  | Cars  | Cars   | Cars            | Per cent of total |
| <i>Coast District: total</i> .....      | 974   | 1,276 | 1,622 | 2,105 | 2,403 | 2,378 | 3,845  | 2,875           | 32.1              |
| Santa Clara.....                        | 496   | 780   | 753   | 924   | 926   | 854   | 1,364  | 1,048           | 11.7              |
| Mendocino†.....                         | 135   | 89    | 269   | 524   | 729   | 637   | 1,465  | 944             | 10.6              |
| Sonoma.....                             | 115   | 116   | 235   | 287   | 323   | 364   | 283    | 323             | 3.6               |
| Napa.....                               | 24    | 46    | 85    | 116   | 106   | 199   | 367    | 224             | 2.5               |
| San Benito.....                         | 125   | 114   | 147   | 137   | 167   | 156   | 159    | 161             | 1.8               |
| Monterey.....                           | 43    | 53    | 55    | 45    | 84    | 85    | 121    | 97              | 1.1               |
| Santa Cruz.....                         | 26    | 65    | 63    | 55    | 49    | 55    | 66     | 57              | 0.6               |
| Marin.....                              | 10    | 13    | 15    | 17    | 19    | 28    | 20     | 22              | 0.2               |
| <i>Sacramento Valley: total</i> .....   | 2,894 | 2,277 | 3,184 | 3,827 | 2,735 | 4,494 | 5,463  | 4,231           | 47.3              |
| Sacramento.....                         | 2,194 | 1,305 | 2,086 | 2,221 | 1,701 | 2,681 | 3,109  | 2,497           | 25.0              |
| Contra Costa.....                       | 354   | 452   | 496   | 529   | 396   | 534   | 556    | 495             | 5.5               |
| Solano.....                             | 117   | 316   | 348   | 557   | 283   | 500   | 688    | 490             | 5.5               |
| Yuba.....                               | 71    | 101   | 88    | 252   | 199   | 276   | 487    | 321             | 3.6               |
| Yolo.....                               | 42    | 19    | 46    | 120   | 47    | 147   | 242    | 145             | 1.6               |
| San Joaquin.....                        | 15    | 16    | 55    | 21    | 40    | 96    | 144    | 93              | 1.0               |
| Glenn.....                              |       |       |       |       | 19    | 80    | 66     | 55              | 0.6               |
| Shasta.....                             | 0     | 12    | 18    | 19    | 25    | 60    | 18     | 34              | 0.4               |
| Tehama.....                             | 30    | 42    | 25    | 28    | 10    | 55    | 20     | 28              | 0.3               |
| Sutter.....                             | 62    | 11    | 9     | 69    | 6     | 53    | 44     | 34              | 0.4               |
| Colusa.....                             | 9     | 3     | 13    | 11    | 9     | 12    | 89     | 37              | 0.4               |
| <i>Southern California: total</i> ..... | 144   | 223   | 298   | 244   | 199   | 170   | 159    | 176             | 2.0               |
| Kern.....                               | 18    | 0     | 112   | 22    | 60    | 9     | 79     | 85              | 0.9               |
| Los Angeles.....                        | 106   | 174   | 133   | 165   | 86    | 112   | 57     | 49              | 0.6               |
| Riverside.....                          | 11    | 35    | 40    | 49    | 46    | 36    | 23     | 35              | 0.4               |
| Imperial.....                           | 9     | 14    | 13    | 8     | 7     | 13    |        | 7               | 0.1               |
| <i>Mountain: total</i> .....            | 947   | 667   | 1,242 | 816   | 787   | 1,468 | 2,130  | 1,462           | 16.3              |
| Placer.....                             | 687   | 596   | 754   | 582   | 586   | 1,194 | 1,318  | 1,033           | 11.5              |
| El Dorado.....                          | 249   | 57    | 478   | 218   | 188   | 255   | 812    | 418             | 4.7               |
| Amador.....                             | 11    | 14    | 10    | 16    | 13    | 19    |        | 11              | 0.1               |
| <i>Other counties: total</i> .....      | 62    | 55    | 111   | 158   | 173   | 176   | 284    | 211             | 2.3               |
| <i>State total</i> .....                | 5,021 | 4,498 | 6,457 | 7,150 | 6,297 | 8,686 | 11,881 | 8,955           | 100.0             |

\* Data for 1926 are preliminary and subject to revision.

† Shipments reported from Mendocino include those from Lake County, which has no railroad loading points.

Data for years 1920-1923 from: Carload Shipments of Fruits and Melons from Stations in the United States, 1920-1923, U. S. Dept. Agr. Stat. Bul. 8: 51-56. 1925; for years 1924 and 1925 from: Carload Shipments of Fruits and Vegetables from Stations in the United States 1924 and 1925. U. S. Dept. Agr. Stat. Bul. 19: 47-52. 1927; for year 1926 from preliminary mimeographed release of Los Angeles office of the Market News Service of the U. S. Bureau of Agricultural Economics, April 30, 1927.

(Footnote for table 32 continued from preceding page.)

Carlot shipment figures as reported by the carriers to the U. S. Dept. of Agriculture are believed to be appreciably incomplete before 1920 but, as a result of improvements in the Market News Service, reasonably complete thereafter.

Data for 1917-1919 for California are rough estimates by the author (to nearest hundred cars) on the basis of interstate shipments north of Tehachapi as 95 per cent of the state's total shipments—local and interstate, both north and south of Tehachapi; for 1917-1919 for Missouri, Pennsylvania, and Virginia from: Hansen, C. J., and O. W. Holmes. California pear deal, 1925. U. S. Bur. Agr. Econ. (mimeo. summary) p. 9. 1926; for 1917-1919 for all other states from U. S. Dept. Agr. Yearbook, 1923: 751. 1924. Data for Missouri, Pennsylvania, and Virginia for 1920-1923 from: Carload Shipments of Fruits and Melons from Stations in the United States, 1920-1923. U. S. Dept. Agr. Stat. Bul. 8: 51-56. Feb., 1925, and for 1924 and 1925 from U. S. Dept. Agr. Stat. Bul. 19: 47-52. Feb., 1927. Data for all other states for 1920-1925 compiled on crop year basis from mimeographed releases by the U. S. Bur. Agr. Econ. of monthly shipments of pears by states of origin. Data for all states for the 1926 season and the 1927 through Dec. 31, 1927, compiled from the mimeographed Weekly Summary of Carlot Shipments issued by the U. S. Bur. Agr. Econ.

TABLE 34

CALIFORNIA BEARING PEAR ACREAGE BY COUNTIES AND DISTRICTS, 1921-1927,  
AND NON-BEARING AND TOTAL, 1927

| County and district                     | 1921              |        | 1922   | 1923   | 1924   | 1925   | 1926   | 1927*         |                         |                   |        |
|-----------------------------------------|-------------------|--------|--------|--------|--------|--------|--------|---------------|-------------------------|-------------------|--------|
|                                         | Per cent of total | acres  | acres  | acres  | acres  | acres  | acres  | Bearing acres | Per cent of state total | Non-bearing acres | Total  |
| <i>Coast District: total</i> .....      | 29.4              | 9,332  | 10,899 | 11,883 | 13,000 | 15,310 | 17,490 | 20,421        | 35.1                    | 14,885            | 35,306 |
| Santa Clara.....                        | 7.9               | 2,500  | 2,950  | 3,400  | 3,850  | 3,940  | 4,060  | 5,284         | 9.1                     | 1,786             | 7,070  |
| Lake.....                               | 2.8               | 900    | 1,564  | 1,844  | 2,130  | 2,801  | 3,423  | 4,038         | 6.9                     | 3,669             | 7,707  |
| Sonoma.....                             | 4.3               | 1,375  | 1,250  | 1,250  | 1,300  | 1,450  | 1,550  | 1,750         | 3.0                     | 1,170             | 2,920  |
| Mendocino.....                          | 1.9               | 605    | 605    | 605    | 605    | 750    | 1,270  | 1,615         | 2.8                     | 2,624             | 4,239  |
| Napa.....                               | 2.1               | 656    | 723    | 790    | 1,002  | 1,352  | 1,500  | 1,500         | 2.6                     | 2,275             | 3,775  |
| San Luis Obispo.....                    | 4.7               | 1,487  | 1,564  | 1,620  | 1,675  | 1,775  | 1,800  | 1,320         | 2.3                     | 240               | 1,560  |
| Alameda.....                            | 2.5               | 800    | 800    | 800    | 800    | 1,150  | 1,148  | 1,248         | 2.1                     | 180               | 1,428  |
| San Benito.....                         | 0.9               | 275    | 360    | 445    | 531    | 631    | 673    | 1,164         | 2.0                     | 685               | 1,849  |
| Monterey.....                           | 0.5               | 160    | 313    | 331    | 350    | 400    | 821    | 1,010         | 1.7                     | 1,207             | 2,217  |
| Santa Cruz.....                         | 1.3               | 400    | 500    | 500    | 500    | 600    | 700    | 729           | 1.3                     | 671               | 1,400  |
| San Mateo.....                          | 0.1               | 24     | 107    | 118    | 128    | 150    | 225    | 429           | 0.7                     | 130               | 559    |
| Marin.....                              | 0.3               | 85     | 90     | 105    | 120    | 160    | 160    | 167           | 0.3                     | 88                | 255    |
| Humboldt.....                           | 0.2               | 65     | 73     | 75     | 75     | 154    | 160    | 167           | 0.3                     | 160               | 327    |
| <i>Sacramento Valley: total</i> .....   | 40.4              | 12,783 | 14,788 | 16,185 | 16,655 | 16,950 | 18,498 | 19,806        | 34.1                    | 8,658             | 28,464 |
| Sacramento.....                         | 16.9              | 5,347  | 6,347  | 6,376  | 6,400  | 6,244  | 6,400  | 7,000         | 12.1                    | 3,000             | 10,000 |
| Solano.....                             | 6.6               | 2,100  | 2,600  | 3,050  | 3,200  | 3,300  | 3,455  | 3,483         | 6.0                     | 630               | 4,113  |
| Contra Costa.....                       | 4.7               | 1,500  | 1,500  | 1,750  | 2,000  | 2,220  | 3,207  | 3,359         | 5.8                     | 1,315             | 4,674  |
| Yolo.....                               | 3.4               | 1,072  | 1,200  | 1,235  | 1,270  | 1,300  | 1,400  | 1,540         | 2.6                     | 1,313             | 2,853  |
| San Joaquin.....                        | 2.9               | 881    | 1,011  | 1,200  | 1,228  | 1,256  | 1,284  | 1,310         | 2.3                     | 1,412             | 2,722  |
| Yuba.....                               | 0.6               | 200    | 250    | 700    | 700    | 725    | 775    | 868           | 1.5                     | 397               | 1,265  |
| Butte.....                              | 1.4               | 450    | 450    | 456    | 462    | 489    | 583    | 683           | 1.2                     | 57                | 740    |
| Sutter.....                             | 1.2               | 380    | 485    | 490    | 495    | 500    | 572    | 598           | 1.0                     | 328               | 926    |
| Glenn.....                              | 1.4               | 442    | 534    | 534    | 524    | 531    | 449    | 479           | 0.8                     | 77                | 556    |
| Tehama.....                             | 0.8               | 247    | 247    | 230    | 212    | 212    | 212    | 306           | 0.5                     | 51                | 357    |
| Shasta.....                             | 0.4               | 120    | 120    | 120    | 120    | 120    | 125    | 125           | 0.2                     | 35                | 160    |
| Colusa.....                             | 0.1               | 44     | 44     | 44     | 44     | 53     | 36     | 55            | 0.1                     | 43                | 98     |
| <i>Southern California: total</i> ..... | 12.7              | 4,036  | 6,550  | 6,905  | 7,241  | 8,124  | 8,649  | 8,277         | 14.2                    | 3,331             | 11,608 |
| Los Angeles.....                        | 7.0               | 2,228  | 4,119  | 4,119  | 4,119  | 4,402  | 4,519  | 4,384         | 7.5                     | 1,519             | 5,903  |
| Riverside.....                          | 1.6               | 497    | 880    | 988    | 1,096  | 1,100  | 1,114  | 1,248         | 2.1                     | 919               | 2,167  |
| Kern.....                               | 1.7               | 542    | 542    | 671    | 800    | 1,060  | 1,175  | 1,180         | 2.0                     | .....             | 1,180  |
| San Bernardino.....                     | 1.7               | 556    | 756    | 870    | 956    | 1,258  | 1,436  | 1,065         | 1.8                     | 571               | 1,636  |
| San Diego.....                          | 0.5               | 150    | 150    | 150    | 150    | 150    | 150    | 159           | 0.3                     | 109               | 268    |
| Ventura.....                            | 0.1               | 23     | 23     | 27     | 30     | 44     | 78     | 99            | 0.2                     | 160               | 259    |
| Orange.....                             | .....             | .....  | .....  | .....  | .....  | 10     | 57     | 57            | 0.1                     | 13                | 70     |
| Santa Barbara.....                      | .....             | .....  | 10     | 20     | 30     | 30     | 50     | 50            | 0.1                     | 30                | 80     |
| Imperial.....                           | 0.1               | 40     | 60     | 60     | 60     | 70     | 70     | 35            | 0.1                     | 10                | 45     |
| <i>Mountain: total</i> .....            | 16.2              | 4,781  | 5,483  | 5,868  | 6,253  | 6,634  | 7,703  | 8,258         | 14.2                    | 2,951             | 11,209 |
| Placer.....                             | 8.2               | 2,610  | 2,860  | 3,070  | 3,280  | 3,359  | 3,726  | 3,712         | 6.4                     | 1,505             | 5,217  |
| Eldorado.....                           | 3.9               | 1,200  | 1,500  | 1,650  | 1,800  | 2,000  | 2,300  | 2,600         | 4.5                     | 1,120             | 3,720  |
| Nevada.....                             | 2.5               | 800    | 900    | 925    | 950    | 1,050  | 1,370  | 1,407         | 2.4                     | 23                | 1,430  |
| Inyo.....                               | 0.2               | 50     | 50     | 50     | 50     | 50     | 50     | 205           | 0.4                     | 250               | 455    |
| Tuolumne.....                           | 0.1               | 25     | 75     | 75     | 75     | 75     | 125    | 200           | 0.3                     | 50                | 250    |
| Amador.....                             | 0.1               | 36     | 38     | 38     | 38     | 40     | 72     | 72            | 0.1                     | 2                 | 74     |
| Calaveras.....                          | 0.2               | 60     | 60     | 60     | 60     | 60     | 60     | 62            | 0.1                     | 1                 | 63     |
| <i>Other counties: total</i> .....      | 2.3               | 786    | 881    | 990    | 1,100  | 1,256  | 1,268  | 1,376         | 2.4                     | 1,043             | 2,419  |
| <i>State Total</i> .....                | 100.0             | 31,718 | 38,591 | 41,831 | 44,315 | 48,277 | 53,608 | 58,138        | 100.0                   | 30,868            | 89,006 |

\* Data for 1927 are preliminary and subject to revision.

Data on acreage for all other years are revised figures compiled by N. I. Nielsen of the California Cooperative Crop Reporting Service, Sacramento, California, May, 1927.

TABLE 35

PRICE AND PURCHASING POWER OF CHIEF VARIETIES OF OREGON PEARS AND OF CALIFORNIA BARTLETT'S, 1917-1926  
(New York delivered-auction and estimated f.o.b. shipping points, in dollars.)

| Year      | Gross auction       |           | Estimated f.o.b. |           | Gross auction                  |           | Estimated f.o.b. |           | Gross auction   |           | Estimated f.o.b. |           | Gross auction                       |           | Estimated f.o.b. |           |                                     |      |      |      |
|-----------|---------------------|-----------|------------------|-----------|--------------------------------|-----------|------------------|-----------|-----------------|-----------|------------------|-----------|-------------------------------------|-----------|------------------|-----------|-------------------------------------|------|------|------|
|           | Actual              | De-flated | Actual           | De-flated | Actual                         | De-flated | Actual           | De-flated | Actual          | De-flated | Actual           | De-flated | Actual                              | De-flated | Actual           | De-flated |                                     |      |      |      |
|           |                     |           |                  |           |                                |           |                  |           |                 |           |                  |           |                                     |           |                  |           |                                     |      |      |      |
|           | California Bartlett |           |                  |           | Oregon late varieties, average |           |                  |           | Oregon Bartlett |           |                  |           | California-Oregon Bartlett, average |           |                  |           | Oregon Bosc                         |      |      |      |
| 1917..... | 2.80                | 1.55      | 1.86             | 1.03      | 2.26                           | 1.26      | 1.30             | 0.73      | 1.89            | 1.05      | 0.96             | 0.53      | 2.72                                | 1.51      | 1.73             | 0.97      | 3.18                                | 1.77 | 2.15 | 1.19 |
| 1918..... | 3.40                | 1.72      | 2.25             | 1.14      | 3.50                           | 1.77      | 2.27             | 1.15      | 3.59            | 1.81      | 2.34             | 1.18      | 3.31                                | 1.67      | 2.09             | 1.06      | 4.65                                | 2.35 | 3.33 | 1.68 |
| 1919..... | 3.85                | 1.83      | 2.22             | 1.06      | 4.36                           | 2.08      | 3.07             | 1.46      | 3.83            | 1.82      | 2.57             | 1.22      | 3.95                                | 1.88      | 2.69             | 1.28      | 5.46                                | 2.60 | 4.08 | 1.94 |
| 1920..... | 4.35                | 1.89      | 2.85             | 1.24      | 4.98                           | 2.16      | 3.33             | 1.45      | 3.70            | 1.61      | 2.15             | 0.94      | 4.30                                | 1.87      | 2.70             | 1.17      | 6.00                                | 2.61 | 4.28 | 1.86 |
| 1921..... | 3.50                | 2.33      | 2.06             | 1.37      | 4.25                           | 2.84      | 2.65             | 1.77      | 3.00            | 2.00      | 1.49             | 0.99      | 2.92                                | 1.95      | 1.37             | 0.91      | 5.24                                | 3.50 | 3.58 | 2.39 |
| 1922..... | 2.75                | 1.81      | 1.49             | 0.98      | 3.53                           | 2.32      | 2.12             | 1.40      | 2.19            | 1.44      | 0.88             | 0.58      | 2.75                                | 1.81      | 1.40             | 0.92      | 4.15                                | 2.73 | 2.77 | 1.77 |
| 1923..... | 3.00                | 1.91      | 1.72             | 1.10      | 3.62                           | 2.31      | 2.22             | 1.41      | 3.46            | 2.10      | 2.06             | 1.31      | 3.07                                | 1.96      | 2.69             | 1.70      | 4.37                                | 2.78 | 2.91 | 1.85 |
| 1924..... | 3.85                | 2.53      | 2.51             | 1.65      | 4.66                           | 3.07      | 3.17             | 2.10      | 4.03            | 2.65      | 2.59             | 1.71      | 3.94                                | 2.60      | 2.50             | 1.65      | 5.00                                | 3.30 | 3.49 | 2.20 |
| 1925..... | 2.75                | 1.70      | 1.49             | 0.98      | 3.96                           | 2.45      | 2.54             | 1.57      | 3.93            | 2.43      | 2.50             | 1.54      | 2.86                                | 1.77      | 1.52             | 0.93      | 4.26                                | 2.63 | 2.81 | 1.73 |
| 1926..... | 2.65                | 1.72      | 1.40             | 0.91      | 3.16                           | 2.05      | 1.78             | 1.15      | 2.63            | 1.71      | 1.29             | 0.84      | 2.64                                | 1.72      | 1.30             | 0.85      | 3.20                                | 2.08 | 1.82 | 1.18 |
| 1927..... | 3.32                | 2.23      | 2.02             | 1.35      |                                |           |                  |           |                 |           |                  |           |                                     |           |                  |           |                                     |      |      |      |
| 1928..... |                     |           |                  |           |                                |           |                  |           |                 |           |                  |           |                                     |           |                  |           |                                     |      |      |      |
|           | Oregon Anjou        |           |                  |           | Oregon Bosc-Anjou, average     |           |                  |           | Oregon Comice   |           |                  |           | Oregon Winter Nelis                 |           |                  |           | Oregon Comice-Winter Nelis, average |      |      |      |
| 1917..... | 2.64                | 1.47      | 1.65             | 0.92      | 2.75                           | 1.53      | 1.86             | 1.03      | 2.03            | 1.13      | 1.09             | 0.61      | 2.22                                | 1.23      | 1.26             | 0.70      | 2.16                                | 1.20 | 1.25 | 0.69 |
| 1918..... | 3.70                | 1.87      | 2.45             | 1.24      | 4.16                           | 2.10      | 2.88             | 1.46      | 3.42            | 1.73      | 2.19             | 1.11      | 2.75                                | 1.39      | 1.56             | 0.79      | 2.75                                | 1.39 | 1.57 | 0.79 |
| 1919..... | 4.30                | 2.04      | 3.00             | 1.43      | 4.66                           | 2.22      | 3.35             | 1.60      | 3.59            | 1.71      | 2.34             | 1.11      | 4.01                                | 1.91      | 2.73             | 1.30      | 3.80                                | 1.81 | 2.55 | 1.21 |
| 1920..... | 4.89                | 2.13      | 3.25             | 1.42      | 5.49                           | 2.38      | 3.81             | 1.66      | 4.24            | 1.80      | 2.65             | 1.16      | 3.64                                | 1.58      | 2.09             | 0.91      | 3.91                                | 1.70 | 2.34 | 1.02 |
| 1921..... | 3.97                | 2.64      | 2.40             | 1.60      | 4.67                           | 3.12      | 3.04             | 2.02      | 3.82            | 2.55      | 2.26             | 1.50      | 3.16                                | 2.11      | 1.64             | 1.09      | 3.34                                | 2.22 | 1.81 | 1.21 |
| 1922..... | 3.56                | 2.34      | 2.15             | 1.41      | 3.95                           | 2.60      | 2.44             | 1.61      | 3.01            | 1.98      | 1.64             | 1.08      | 2.65                                | 1.74      | 1.31             | 0.86      | 2.79                                | 1.84 | 1.33 | 0.88 |
| 1923..... | 3.46                | 2.10      | 2.06             | 1.31      | 3.89                           | 2.48      | 2.45             | 1.56      | 2.75            | 1.75      | 1.40             | 0.89      | 3.12                                | 1.99      | 1.74             | 1.11      | 2.99                                | 1.91 | 1.62 | 1.03 |
| 1924..... | 4.54                | 2.99      | 3.06             | 2.02      | 4.86                           | 3.20      | 3.36             | 2.22      | 3.96            | 2.60      | 2.52             | 1.66      | 3.73                                | 2.46      | 2.31             | 1.52      | 3.88                                | 2.57 | 2.46 | 1.63 |
| 1925..... | 3.94                | 2.43      | 2.51             | 1.55      | 4.08                           | 2.52      | 2.63             | 1.62      | 3.80            | 2.34      | 2.38             | 1.46      | 3.41                                | 2.10      | 2.02             | 1.25      | 3.60                                | 2.22 | 2.19 | 1.35 |
| 1926..... | 3.14                | 2.04      | 1.76             | 1.14      | 3.18                           | 2.06      | 1.79             | 1.16      | 3.14            | 2.04      | 1.76             | 1.14      | 2.38                                | 1.54      | 1.05             | 0.68      | 3.06                                | 1.99 | 1.69 | 1.10 |
| 1927..... |                     |           |                  |           |                                |           |                  |           |                 |           |                  |           |                                     |           |                  |           |                                     |      |      |      |
| 1928..... |                     |           |                  |           |                                |           |                  |           |                 |           |                  |           |                                     |           |                  |           |                                     |      |      |      |

Sources of data: California Bartlett prices from table 6, page 38. Prices of Oregon pears are the season's weighted average on the New York delivered-auction markets through December of each year. 1917-1924, computed from volume and price of daily auction sales as compiled by the Stewart Fruit Co. from the New York Daily Fruit Reporter. Prices for 1925 and 1926 compiled by the author from the same source.

The f. o. b. California and Oregon shipping-point price is estimated by subtracting the approximate carload freight and refrigeration per box to New York City and a 7-per-cent auction sales commission from the actual average gross auction price. The freight and refrigeration rates from California are shown in table 6, page 38. In computing the charge on Oregon pears a gross weight of 51 pounds a box was used. The carload freight and refrigeration rates from Medford, Oregon, to New York City used were as follows plus a 3-per-cent war tax for the years 1918-1921: freight per 100 pounds, 1917, \$1.25; 1918-1919, \$1.56; 1920-1921, \$2.08; 1922-1923, \$1.87; 1926, \$1.73. Refrigeration rate per carload of 26,000 pounds, 1917, \$77.50; 1918-1919, \$75; 1920-1927, \$95.

Actual auction prices and estimated f. o. b. prices are deflated or converted to approximate purchasing power by dividing by the U. S. Bureau of Labor Statistics all-commodity wholesale-price index for the United States for calendar years converted to a 1910-1914 base of 100.

The annual averages of the different groups of varieties are weighted by the volume of sales shown in table 1, page 15.

TABLE 36  
WEEKLY SALES OF PACIFIC COAST PEARS AT NEW YORK DELIVERED-AUCTIONS BY CHIEF VARIETIES, 1926

| Week ending     | All varieties |            |           | Bartletts |            |           | Total of all varieties but Bartletts |         |            | Bosc   |            | Anjou  |            | Comice |            | W. Nels |             | B. Hardy | Clair-geau | Flemish | Others, including Flemish |        |
|-----------------|---------------|------------|-----------|-----------|------------|-----------|--------------------------------------|---------|------------|--------|------------|--------|------------|--------|------------|---------|-------------|----------|------------|---------|---------------------------|--------|
|                 | Total         | Wash.-Ore. | Calif.    | Total     | Wash.-Ore. | Calif.    | Wash.-Ore.                           | Calif.  | Wash.-Ore. | Calif. | Wash.-Ore. | Calif. | Wash.-Ore. | Calif. | Wash.-Ore. | Calif.  | *Wash.-Ore. |          |            |         |                           | Calif. |
| June 25         | 1,160         |            | 1,160     | 1,160     |            | 1,160     |                                      |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| July 2          | 7,630         |            | 7,630     | 7,630     |            | 7,630     |                                      |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| 9               | 87,455        |            | 87,455    | 87,455    |            | 87,455    |                                      |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| 16              | 153,380       |            | 153,380   | 153,380   |            | 153,380   |                                      |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| 23              | 148,090       |            | 148,090   | 148,090   |            | 148,090   |                                      |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| 30              | 163,845       |            | 163,845   | 163,845   |            | 163,845   |                                      |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| Aug. 6          | 129,967       | 530        | 129,437   | 125,520   | 530        | 124,990   | 4,447                                |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| 13              | 127,483       | 15,200     | 112,283   | 123,045   | 15,200     | 107,865   | 4,388                                |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| 20              | 127,041       | 1,335      | 125,706   | 123,560   | 1,335      | 122,255   | 3,451                                |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| 27              | 190,671       | 20,980     | 169,691   | 179,860   | 20,420     | 159,440   | 560                                  | 10,251  |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| Sept. 3         | 226,252       | 28,090     | 198,162   | 202,070   | 24,815     | 177,255   | 3,275                                | 20,907  |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| 10              | 109,603       | 18,870     | 90,733    | 92,840    | 15,055     | 77,785    | 3,815                                | 12,948  |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| 17              | 112,642       | 34,308     | 78,334    | 76,285    | 22,370     | 53,915    | 11,938                               | 24,419  | 4,345      | 1,245  | 2,905      | 1,928  | 1,040      | 2,563  | 945        | 7,175   | 645         | 1,883    | 1,833      | 2,730   | 3,275                     | 288    |
| 24              | 132,451       | 73,015     | 59,436    | 72,525    | 48,655     | 23,870    | 24,360                               | 35,566  | 11,095     | 9,265  | 3,965      | 1,750  | 1,905      | 6,380  | 250        | 1,885   | 10,018      | 5,505    | 3,625      | 4,718   | 1,713                     | 1,348  |
| Oct. 1          | 98,969        | 55,875     | 43,094    | 40,955    | 35,930     | 5,025     | 19,945                               | 38,069  | 10,690     | 4,510  | 3,965      | 1,595  | 1,460      | 8,905  | 130        | 6,400   | 10,843      | 4,495    | 2,070      | 2,595   | 2,715                     | 1,556  |
| 8               | 88,219        | 47,555     | 40,664    | 21,135    | 19,420     | 1,715     | 29,135                               | 38,949  | 19,860     | 4,160  | 1,595      | 1,460  | 4,460      | 8,905  | 130        | 8,020   | 5,338       | 8,445    | 1,215      | 3,090   | 2,531                     | 1,156  |
| 15              | 71,304        | 41,395     | 29,909    | 4,230     | 4,230      |           | 37,165                               | 29,909  | 19,853     | 2,480  | 1,030      | 2,288  | 5,810      | 4,720  |            | 10,240  | 1,420       | 5,985    | 2,220      | 1,472   | 2,776                     |        |
| 22              | 84,161        | 55,607     | 28,554    | 2,300     | 2,300      |           | 42,296                               | 28,544  | 19,788     | 3,535  | 11,730     | 1,050  | 6,833      | 3,540  |            | 11,323  | 160         | 6,823    | 2,220      | 2,705   | 2,113                     |        |
| 29              | 72,526        | 47,203     | 25,323    | 2,040     | 2,040      |           | 45,163                               | 25,323  | 20,743     | 3,170  | 15,010     | 2,388  | 4,990      | 3,005  |            | 8,425   | 3,750       | 2,060    | 2,180      | 4,585   |                           |        |
| Nov. 5          | 57,919        | 39,808     | 18,111    |           |            |           | 39,808                               | 18,111  | 18,565     | 520    | 9,983      | 1,675  | 7,765      | 893    |            | 11,323  | 160         | 6,823    | 2,220      | 2,705   | 2,113                     |        |
| 12              | 52,936        | 42,795     | 10,141    |           |            |           | 42,795                               | 10,141  | 18,565     | 520    | 9,983      | 1,675  | 7,765      | 893    |            | 11,323  | 160         | 6,823    | 2,220      | 2,705   | 2,113                     |        |
| 19              | 32,426        | 28,678     | 3,748     |           |            |           | 28,678                               |         | 8,805      |        | 12,405     | 4,308  | 848        | 2,115  | 2,085      |         |             | 3,535    | 285        | 715     | 1,830                     |        |
| 26              | 33,250        | 24,283     | 8,967     |           |            |           | 24,283                               |         | 8,443      |        | 9,055      | 2,790  | 1,943      | 3,995  | 3,365      |         |             | 610      | 105        | 1,045   | 205                       |        |
| Dec. 3          | 35,839        | 26,928     | 8,911     |           |            |           | 26,928                               |         | 5,160      |        | 17,408     | 520    | 1,943      | 3,995  | 3,365      |         |             | 640      | 100        | 1,088   | 761                       |        |
| 10              | 41,501        | 35,568     | 5,943     |           |            |           | 35,568                               |         | 2,680      |        | 20,888     |        | 1,610      | 1,575  | 10,380     | 5,478   |             |          |            | 465     |                           |        |
| 17              | 39,772        | 32,429     | 7,343     |           |            |           | 32,429                               |         | 5,055      |        | 20,368     |        | 633        |        | 6,373      | 6,040   |             |          |            | 1,303   |                           |        |
| 24              | 27,773        | 24,813     | 2,960     |           |            |           | 24,813                               |         | 880        |        | 15,993     |        | 520        |        | 7,420      | 1,040   |             |          |            | 1,760   |                           |        |
| 31              | 16,063        | 10,005     | 6,058     |           |            |           | 10,005                               |         | 1,450      |        | 3,055      |        |            |        | 5,010      | 4,490   |             |          |            | 490     | 1,568                     |        |
| Totals:         |               |            |           |           |            |           |                                      |         |            |        |            |        |            |        |            |         |             |          |            |         |                           |        |
| June 18-Dec. 31 | 2,456,906     | 691,839    | 1,765,067 | 1,628,005 | 212,300    | 1,415,705 | *479,539                             | 349,362 | 174,022    | 32,166 | 171,240    | 21,970 | 54,464     | 53,989 | 48,558     | 84,429  | 75,614      | 51,539   | 18,465     | 28,365  | 32,545                    |        |
| Jan. 1-Jan. 17  | 318,933       | 226,950    | 91,974    |           |            |           | 226,959                              | 91,974  |            |        | 82,176     |        |            |        | 139,253    | 40,201  |             |          |            | 5,530   | 51,773                    |        |
| Calendar year   | 2,775,839     | 918,798    | 1,857,041 | 1,628,005 | 212,300    | 1,415,705 | *706,498                             | 441,336 | 174,022    | 32,166 | 253,416    | 21,970 | 54,464     | 53,989 | 187,811    | 124,630 | 75,614      | 51,539   | 18,465     | 33,895  | 84,318                    |        |

\* Includes 2,890 boxes of Clairegeous from Oregon.

Source of data: Compiled from the New York Daily Fruit Reporter. Approximately 42,900 boxes of Easter Beurre sold during the period January 1 to June 18 are included in the total of "Others", from the whole Pacific Coast. Pacific Coast totals by varieties for the calendar year are shown in figure 2, page 17.



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